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[OFFICIAL NOTICE.]

Ninth Annual Meeting, Pacific Coast Gas Association.

OFFICE OF THE SECRETARY,
415 POST STREET, SAN FRANCISCO, CAL.,
June 5th, 1901.

To the Members of the Pacific Coast Gas Association : The Ninth Annual Meeting of the Pacific Coast Gas Association will be held at the offices of the San Francisco Gas and Electric Company, 415 Post street, San Francisco, Cal., Tuesday, Wednesday and Thursday, July 16, 17 and 18, 1901.

The technical programme calls for the following :

"President's Address ;" by Mr. John A. Britton, Oakland, Cal.

"Report on International Congress of the Gas Industry, Paris, 1900 ;" by Mr. J. B. Grimwood, San Francisco, Cal.

"Distribution of Alternating Currents ;" by Mr. George C. Holberton, Oakland, Cal.

"Promotion of Domestic Fuel Gas Consumption ;" by Mr. R. P. Valentine, Sacramento, Cal.

"Practical Power Transmission ;" by Mr. John Martin, San Francisco, Cal.

"Experience with Carburetted Water Gas Sets ;" by Mr. A. C. Beck, Oakland, Cal.

"Practical Testing of Oils for Gas and Fuel Purposes ;" by Mr. L. P. Lowe, San Francisco, Cal.

It is urgently requested that members interest themselves in the "Wrinkle" and "Experience" departments, and that their communications thereon be forwarded without delay to the respective Editors thereof : Mr. George H. Hollidge, Merced, Cal.; and Mr. O. M. Gregory, San Jose, Cal. Both named departments offer unlimited opportunities for the advancement of our common interests ; but the measure of success is entirely dependent upon the efforts of the individual members. Let everyone contribute liberally.

Those who have questions to propound are reminded that the same should be forwarded to the Secretary in good season, in order that the "Question Box" should be filled with interesting matter for discussion by the members.

The Secretary announces that his services are at the ready disposal of the members, and that all communications or requests addressed to him will be promptly replied to or answered. He will be at headquarters prior to and during the meeting, and will be glad to render assistance, in the matter of securing hotel accommodations for those living at a distance, or in any other way whatsoever.

An informal meeting will be held at headquarters, Monday evening, July 15th, to which all are cordially invited.

J. B. GRIMWOOD, Secretary.

[OFFICIAL REPORT.]

Obituary Notes, New England Association of Gas Engineers.

At the 31st annual meeting of the New England Association of Gas Engineers, held in Young's Hotel, Boston, Mass., Feb. 19 to 20, 1901, certain committees were named to report suitable resolutions respecting the deaths of members of the Association that occurred in the in-

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tervals of the meetings. The reports are now in hand, and are here published through the attention of the Association's Secretary, Mr. N. W. Gifford, whose advices are dated the 10th inst.:

HENRY A. ATWOOD.

To the President and Members of the New England Association of Gas Engineers: Your Committee, appointed to draught suitable resolutions on the death of Henry A. Atwood, a member of this Association, would respectfully report the following:

The death of our esteemed friend and fellow member occurred Saturday, March 17, 1900, at his home in Plymouth, Mass. Henry Almond Atwood was born in Providence, R. I., April 5th, 1836. For the past 20 years he filled the position of Manager and Superintendent of the Plymouth Gas Company in an able and efficient manner. After an illness extending over many months, during which he bore his afflictions with courage and resignation, he was laid to rest in Dedham, Mass., where he had formerly resided.

Your Committee would recommend that our Secretary be instructed to express to the family of the deceased the regret which we feel in being called upon to part with our old friend, and to extend to them our heartfelt sympathy.

H. A. ALLYN, W. A. LEARNED, } Committee.

ROBERT B. SMITH.

Robert B. Smith died at his home in New Hartford, Conn., May 13th, 1900. He was born in New Hartford, April 15th, 1843, and almost within view of his birthplace was the whole of his useful life spent. He was educated in the schools of his town, and began his business career in Chicago, where for a short time he was clerk in a mercantile establishment.

In 1869 he was appointed agent of the newly organized Greenwoods' Scythe Company of New Hartford, and in 1873 was chosen President of the concern, which was the same year absorbed by the Greenwoods' Company. On the death of his father (Mr. John C. Smith, who was President and Resident Agent of the Greenwoods' Company) he succeeded him as Agent and continued as the Local Manager of the Company's affairs in this town until his death.

Mr. Smith was one of New Hartford's most prominent citizens, and was always ready to help a good cause. He had been a member of the New England Association for nearly 3 years prior to his death, and represented the Greenwoods' Company, which concern owns the gas plant in the village of New Hartford.

His death leaves a very large void in the community where his useful life was spent.

CHARLES H. NETTLETON, F. C. SHERMAN, } Committee.

GEORGE TREADWAY THOMPSON.

To the New England Association of Gas Engineers: Your Committee appointed to recommend action in connection with the death of Mr. George Treadway Thompson, have the honor to recommend the following:

Resolved, That the New England Association of Gas Engineers learns with regret of the untimely death of George Treadway Thompson, and makes this record of its appreciation of his efforts and accomplishments in behalf of the industry of gas supply, and of his many endearing qualities of mind and heart.

WALTON CLARK, WM. E. MCKAY, } Committee.

FRITZ H. TWITCHELL.

To the New England Association of Gas Engineers:

Whereas, Since the last meeting of this Association one of its members, Mr. Fritz H. Twitchell, of Bath, Me., has been removed by death; and,

Whereas, It is fitting that his removal from scenes of activity should be recognized by his associates; therefore, be it

Resolved, That this Association records its appreciation of his merits. He was a native of Portland, Me., and for many years was engaged in active business in the city of Bath, Me., wherein, in connection with many other business enterprises, he was Treasurer of the Bath Gas and Electric Light Company. He had been Mayor of the city of his adoption, represented that city in the House of Representatives, was a high official in the Masonic and Pythian fraternities, and was prominent in many other circles.

Resolved, That this Association extends its sympathy to the members of his family, that a copy of these resolutions be spread upon the records, and another copy be sent to the family of the deceased.

JNO. A. COFFIN, EUGENE H. YORKE, } Committee.

OFFICIAL REPORT.—REVISED BY THE SECRETARY.—CONTINUED FROM PAGE 889.]

PROCEEDINGS, TWENTY-FOURTH ANNUAL MEETING WESTERN GAS ASSOCIATION.

HELD IN THE GALT HOUSE, LOUISVILLE, KY., MAY 15, 16 AND 17, 1901.

FIRST DAY—AFTERNOON SESSION.

The President introduced Mr. F. H. Shelton, of Philadelphia, Pa., who read the following paper on

A GAS ASSOCIATION LIBRARY.

A good deal of attention of late has been given to various ways of extending educational work in the gas business. It seems to me that an extensive and properly handled gas association library would be not only an exceedingly helpful means of education to young men and students in the business, but a constant assistance as well to all the working members of our Association, and for this reason:

Technical books record the well settled standard facts of a profession, trade or business. Books contain the best information pertaining to it. First or last, moreover, some one or other is pretty apt to have written upon almost every topic and department. And what is put into cold print is, as a rule, tolerably correct and trustworthy to withstand the critics. The great practical trouble is that, while there is an excellent amount of gas writing and gas books, and the literature of the business contains and records most of the information and facts essential to gas education and success, the majority of gas workers, as a rule, do not know it, or, if they do, have no way of getting access to the books and articles they want. Innumerable times a gas man keeps on groping in the dark, failing to accomplish something and losing money, because of a lack of information upon some particular thing in his business, when, if he only knew it, and could put his fingers on it, some book or some printed article would often tell him exactly what he wants to know and would save him a world of experimenting, repetition and wasted energy.

In theory, excellent information upon almost any gas subject is now in print, but in practice the benefit of 95 per cent. of the information that is printed half the time is lost: For instance: A paper appears in a GAS JOURNAL on the making, say, of tar pavements. At the time it is read with interest by some, but some only; others never even see it. A few years later it is mostly forgotten, and a man who wants to work up his tar locally, in the first place, may never have heard of how it could be successfully worked; in the second place, if he has, may have forgotten it; and, in the third place, if he remembers some such paper, he has no means of locating and getting it, to read up. Again, a book is published in England, say, on the construction and operation of regenerative furnaces. Eighty per cent. of the gas men on this side do not know of the existence of such a book; 18 per cent. may note it and forget it; 2 per cent. may buy a few copies. The average man, in trouble with his furnaces, or wrestling with the design of new ones, gropes on without the aid that such a book would give him, if he could only know of it and could borrow it for a week, from an association library. Do I need to especially argue that an extensive gas library, with a complete index and an adequate method of making its contents known to the members, would be of the greatest practical value?

A library manifestly must be reasonably complete. It must also be *a circulating* library. It would do an Arkansas member little good if the books could never be moved from New Albany. The index, moreover, must be full, fresh and convenient to refer to—and, finally, that index or record of what is in the library, and of what is added to it, must regularly and steadily be sent to every member, by some dependable, definite system, whether he inquires for it or not. Consider, then, the result and the help to the student or the business. A young man, for instance, assisting in a gas works is working up gas engines. He is clever, and takes to them from the excellent work of one that strays into his town. He wants to learn more on the working, the design, the types and the use of gas engines. He sends to the library, gets during a season three or four books on gas engines, learns much that is new to him, and becomes a really capable man on gas engines, of distinctly added value to both himself and employer. The library is largely what did it. Some one again gets tangled on tar take-offs. He turns to the association library index, finds references to six different kinds of tar take-offs from hydraulic, in the wrinkle department (each one of which he admits he has seen before, but had since completely forgotten), and gets fixed up in a jiffy.

A gas association library, to be complete, would have to cover:

1st. A copy of each gas book published; 2d, files of the various gas journals; 3d, sets of the proceedings of the various Gas Associations.

It could readily get the proceedings by exchanging sets of its own for those of other Associations.

It would, undoubtedly, have donated copies of the current gas journals, in return for the privilege of reporting, or other Association courtesies extended to the journals. Gas books it could get by inviting donations, by the courtesy of authors and publishers, and by setting aside a certain yearly fund for purchasing the new books that come out.

To assist in building up a library quickly, honorable mention might be made of the member yearly contributing the most volumes to the library, or even an exemption from dues be made. The character of books should be limited to gas, electrical and kindred subjects, such as coal, petroleum, heat, chemistry, etc. Kindly donations of works on astronomy, or other such unrelated subjects (while valuable in themselves), should be refused, as such would only complicate files and indexes, and take space. Works in foreign languages should be accepted, but scarcely sought or bought. The same expenditure would do more good in English works. Books should be loaned to any member for 2 weeks each, and as much longer time as desired, provided no one else in the meantime applies. Suitable covers for handling and preserving, fines, the deposits, the expense of express and other details can readily be arranged.

The keynote to the working success of such a library is the index. Let me repeat that: It is the index, index, index. A chest of gold is valueless if there is no key. A library is valueless unless the index is sufficient to fully and practically unlock all its wealth of information to every member. In addition to a very complete index of every book and of all articles, a bulletin should be issued every 3 months giving a very brief statement of the size, character, aim and scope of the new books and articles added for the past quarter. This would entail but little work on the Secretary—that is, as to books. An index of the articles in 5 or 6 GAS JOURNALS for 3 months, however, is something of a task. Yet such could not possibly be omitted, for special papers, such as reports on electrolysis and articles of the highest value on subjects of the greatest importance usually get into the JOURNALS, but more often than not do not get into bound book form. The thought occurs that some semi-retired gas man, from love of the business, might undertake to keep the record, or some needy member could do it in return for a modest payment by the Association. And if several Associations joined in supporting one man to collect and tabulate gas literature and get the record of it into the hands of all the members, the expense to each would be slight. Would it not be saved over and over again during the year to some of the companies represented in an Association, from savings effected, or expense avoided by the information gained. I thoroughly believe so.

I have recently become interested in working up a list of gas books and gas works of reference. As a contribution to a library I offer it herewith. It is not a list of all topics, papers and GAS JOURNAL articles whatsoever, but a list of the books proper—generally speaking, and large or small—published first or last, from the beginning in 1815, to date, upon *illuminating* gas matters, uncomplicated by books on other topics. While it is not complete, it is yet much more complete than any such list that I have heretofore known of and, also I believe, has the merit of brevity, clearness and simplicity. Additions to it will be made from time to time. But a glance at the titles, as the list stands in the Appendix herewith, is enough to indicate the mass and variety of information that exist in print on gas matters, that could be made accessible to every member if the majority of such books were assembled in an association library.

Not counting proceedings of Associations, GAS JOURNALS and patent or trade publications, there have been perhaps 200 books on gas issued; enough to classify in groups, as follows:

Early works and treatises; standard text books and hand books; works on gas works subjects; on distribution subjects; on miscellaneous gas topics; on chemistry; on photometry; on legal questions; and also statistical and trade directories; State gas reports (Mass. Commission, etc.); government reports on gas; GAS JOURNALS; Association proceedings; and all these are exclusive of books on electricity, steam, heat, light, coal, oil, natural gas, acetylene, municipal control, gas producers for metallurgical work, gasoline machines, and kindred allied topics that could consistently be added to an association library.

It is also evident from the list of books appended that the great source of gas literature in our language is England. There have been 20 books there for every one published here. The United States has naught to be proud of in such respect; 90 per cent. of English gas literature, however, applies just as well here. We get from the English books much which otherwise we would not have, and with so much extensive gas matter there published at a distance, we are particularly apt to be ignorant of what there is, and particularly need a definite system for bringing it to our attention, and within our reach.

Mr. George Treadway Thompson undoubtedly had in mind the use and value of an association library, when he bequeathed his private library to this Association. I most earnestly hope that with it as a nucleus and starting point, an association library, comprehensive, growing and wonderfully helpful to the members, will be inaugurated and hereafter conducted. I believe the Western Association has now the opportunity to signally lead the way in a new field of educational work, and I hope—and believe—that libraries that other Associations may hereafter establish, will never surpass in scope, liberal support, or usefulness, the first of such that may be started by the "Western."

APPENDIX.

The following list of gas books was made as a result of consulting these libraries: Franklin Institute, Engineers' Club, Philadelphia Library, Philadelphia; Cooper Union, New York; Boston Public Library, Boston. I have received marked assistance toward rendering it as full as possible from James Dunbar, on behalf of the Western Gas Association; William Henry White, Eugene Vanderpool, E. C. Brown, W. W. Goodwin, Wm. Borsodi, and the United Gas Improvement Company, to all of whom I am indebted. The list has been further amplified by reference to the trade lists of gas books issued by the GAS LIGHT JOURNALS, and the principal technical book stores, as well as by notes gathered in rummaging through many old book shops.

The list, I think, is fairly complete, and, undoubtedly, covers most of the books—and the chief books—written upon gas. A few days ago, and after its compiling, I ran across a book by Mr. F. S. Cripps, of England, published in 1894, which covers the same ground excepting very much more fully; perhaps so fully as to be complex, as it includes magazine articles on gas, proceedings of various societies and works in French, German and other languages. Mr. Cripps' book, however, represents vastly more work and results than the simple list herewith offered, and anyone especially studying the subject should, undoubtedly, consult it if possible. The classification that I have adopted is as follows: Text books, handbooks and general works; gas works subjects, distribution subjects, gas chemistry, photometry, miscellaneous, legal, trade directories and statistical, State and Government reports, gas trade journals, gas association proceedings.

The list is intended to cover *illuminating gas* literature only. The line had to be drawn somewhere, and various allied subjects are not included. That is, the list does not cover natural gas, acetylene "gasoline gas" machines, patent or advertising process pamphlets, or the voluminous but local reports and printed matter of the special Massachusetts water gas controversy. Nor does it cover reprints of Association papers, popular scattered magazine articles, nor printed matter on "gas producers" as used in metallurgical work, nor other fuel or "blue gas" papers. General treatises on light, heat, coal, petroleum, etc., are not included. City gas works reports are excluded as being of purely local interest. Works in other than the English language are not covered. It is simply a list of "books on illuminating gas," as popularly understood.

It is my intention to add to the list from time to time, as I come across other books, to check it up as opportunity offers and to publish it later in fuller form. I will be greatly obliged to any who will aid in its completeness by additions to it, or who will point out errors or make corrections. Communications may be addressed to me at 112 North Broad street, Philadelphia.—F. H. SHELTON.

Text Books, Hand Books and Early Works.

Various Pamphlets; F. A. Winsor; 2 editions, 1804–1805.

A Practical Treatise on Gas Light; Frederick Accum; 1st to 4th editions, 1815–1819.

Description of the Process for Manufacturing Coal Gas, etc.; Frederick Accum; 1st and 2d editions, 1819–1822.

Some Information on Gas Lighting; Thomas Cooper, Philadelphia, 1816.

A History of the Origin and Progress of Gas Lighting; William Matthews, London; 1st and 2d editions, 1827–1832.

A Compendium of Gas Lighting; William Matthews, London; 1st and 2d editions, 1827–1832.

A Practical Treatise on the Manufacture of Gas; Thomas S. Peckston, London; 1st to 3d editions, 1819–1841.

A Practical Treatise on the Manufacture of Gas; Samuel Clegg, Jr., London; 1st to 5th editions, 1841–1872.

The Construction of Gas Works and the Manufacture and Distribution of Coal Ga ; Samuel Hughes, London, 1st edition, 1853 ; 2d to 8th editions, Samuel Hughes and William Richards, 1865–1892.

Coal Gas ; Joshua Kidd, London, 1865.

The Construction of Gas Works ; Harry Edward Jones, London, 1875.

A Practical Treatise on the Manufacture and Distribution of Coal Gas ; William Richards, London, 1877.

King's Treatise on the Science and Practice of the Manufacture and Distribution of Coal Gas ; Thomas Newbigging and W. F. Fewtrell, London, 1st and 2d editions, 1878–1882.

Illuminating and Heating Gas, a Manual of the Manufacture of Gas from Tar, Oil and Other Liquid Hydrocarbons ; W. Burns, London, 1887.

Gas Manufacture ; W. Burns, London.

Gas Lighting, (Volume III. of Chemical Technology, by Groves & Thorp) ; Charles Hunt, London, 1900.

Gas Works, Their Arrangement, Construction, Plant and Machinery ; Frederick Colyer, London, 1884.

The Construction of Gas Works Practically Described ; W. R. Herring, 1st edition, ——, 2d edition, 1893.[1]

Text Book of Gas Manufacture for Students ; John Hornby, London, 1896.

"*Hand Books.*"

Hand Book for Gas Engineers and Managers ; Thomas Newbigging, London, 1st to 6th editions, 1870–1898.

The Gas Engineer's Pocket Book ; Henry O'Connor, London, 1898.

Gas Superintendent's Pocket Companion ; William H. McFadden.

American Gas Engineer's and Superintendent's Handbook ; William Mooney, New York, 1888.[1]

GAS WORKS SUBJECTS.

Coal Gas Benches.

Practical Hints on the Construction and Working of Regenerator Furnaces ; Maurice Graham, 1894.

Water Gas.

The Hydrocarbon Gas Process ; Silliman & Wurtz, 1869.

Report on Water Gas ; Franklin Institute, Philadelphia, 1886.

Illuminating Water Gas : Past and Present ; F. H. Shelton, Philadelphia, 1889.

Water Gas in the United States ; Alex. C. Humphreys, New York, 1889.

Water Gas ; J. F. Bell, 1889.

Water Gas in Small Works ; F. H. Shelton, Philadelphia, 1894.

Publications Upon Carburetted Water Gas ; Humphreys & Glasgow, New York—10 editions, 1894–1900.

Labor Saving Machinery.

Transport of Material for Gas Works ; V. Wyatt, 1881.

Modern Methods of Labor Saving in Gas Works ; C. E. Brackenbury, P. S. King & Son, Orchard House, Westminster, 1901.

Scrubbers, Condensers, Exhausters, Purifiers.

Gas Purification : Report of the Proceedings before a Committee of the House of Commons ; London, 1877.

Sulphur Compounds in Gas ; William B. King.

Quantative Estimate Sulphur in Coal Gas ; F. W. Hartley.

Purification of Coal Gas by Lime, Iron and Atmospheric Air ; S. Carpenter.

A Treatise on the Purification of Coal Gas ; R. P. Spice, London, 1884.

Meters.

Gas Measurement and Meter Testing ; F. W. Hartley, 1882.

Gas Meter Testing ; F. W. Hartley, London, 1869.

Gas Measurement ; F. W. Hartley, London, 1873.

Holders.

Plans and Letterpress : Description of the Sydney Gasholder ; Reprinted from the *Journal of Gas Lighting*, London.

Plan and Description of Three Lift Holder ; George Lindsay, London, 1882.

The Guide Framing of Gasholders ; F. S. Cripps, London, 1889.

Gasholder and Tank Construction ; F. S. Cripps, London, 1898.

Gasholder With or Without Guide Framing ; F. S. Cripps and E. L Pease, London.

Governors, Gas Coals and Coke.

The Principle of the Valuation of Gas Coals and Cannels ; D. A. Graham, Oldham, 1872.

A Treatise on the Comparative Commercial Values of Gas Coals and Cannels ; D. A. Graham, London, 1882.

Notes on the Lithology of Gas Coals, with List of Commercial Analysis ; James Patterson.

Analysis of Scotch Coals, Cannel, Splint, Shale, etc., Used in the Manufacture of Gas ; Dr. William Wallace.

Chemistry of Coke ; Anderson, 1899.

1. Out of print.

Management.

Instructions for the Management of Gas Works ; W. E. Holmes, 1872.

The Management of Small Gas Works ; C. J. R. Humphreys, 1884.[1]

DISTRIBUTION.

Street Mains.

The Flow of Gases and Proportioning Gas Mains ; F. S. Cripps, 1892.

Gas Flow Computer ; Wm. Cox, New York.

Gas Burners.

Gas Burners, Old and New ; Owen Merriman.

The Incandescent Gas Light ; Wilhelm Gentsch ; Progressive Age, New York.

Gas Engines.

(Not included.)

Street Lighting.

Modern Street Lighting ; William Sugg ; 1st and 2d editions, 1871, 1887.

The Science and Practice of Lighting as Applied to Streets, Open Spaces and Interiors ; W. H. Y. Webber, London, 1892.

Gas Piping.

Gas Fitters' and Plumbers' Companion ; Galloway.

Gas Fittings ; John Black, London, 1890.

Gas Lighting and Gas ; Wm. Paul Gerhard, 1894.

Practical Gas Fitting ; A Reprint from *Metal Worker ;* Williams, New York, 1896.

Gasfitters' Guide ; John Eldridge.

Practical Gas Fitting : Reprint from *Work* and *Building World ;* Paul N. Hasluck, 1900.

Gas Office Subjects.

A System for Keeping the Histories and Accounts of Gas Light Companies ; W. P. Fodell, Philadelphia, 1869.

Gas Companies Bookkeeping ; J. H. Brearley and Benjamin Taylor, London, 1900.

Application and Use : Stoves, Appliances, Etc.

Advantages of Gas in Private Houses ; J. O. N. Rutter, London ; 1st and 2d editions, 1855–1865.

A Practical Treatise on Gas and Ventilation ; E. E. Perkins, London : 1st and 2d editions, 1856–1869.

Gas Consumers' Manual ; T. L. Marriott, 1860.

Gas Consumers' Guide ; Wm. Richards, 1866.

Gas Consumers' Handy Book ; Wm. Richards, 1877.

Gas Consumers' Guide ; Alex. Moore, Boston, 1871.

The Domestic Uses of Coal Gas ; Wm. T. Sugg, 1884.

Gas as a Source of Light, Heat and Power ; C. J. R. Humphreys, 1886.

Art of Cooking by Gas ; M. J. Sugg, 1890.

Commercial Uses of Coal, Gas ; Thomas Fletcher—Fletcher, Russell & Co., Warrington.

Gas for Light and Work in the Workshop.

Common Sense for Gas Users ; Robert Wilson, London, 1877.

Gas Light Manual ; John Campbell, Glasgow, 1870.

Gasfitters' Guide ; James Mason, London, 1865.

How to Manage Gas ; F. W. Wilkins, London, 1868.

A Guide to Gas Lighting ; A. H. Wood, London, 1872.

Gas Consumers' Manual ; E. S. Cathels, Montreal, 1873.

Something About the Gas We Burn ; N. H. Humphrys, London, 1881.

The Use of Coal Gas ; Harold B. Dixon.

Generation of Light from Coal Gas ; V. B. Lewes.

Gaseous Illuminants ; V. B. Lewes.

Coal Gas as a Fuel ; Thomas Fletcher—Fletcher, Russell & Co., Warrington, 1890.

Gas Cookery, with Practical Recipes ; Helen Edden.

The Use of Gas for Domestic Lighting ; V. B. Lewes, London, 1897.

CHEMISTRY.

Gasometry.

A Book on Physical Properties and Analysis ; R. Bunsen, Glasgow (?) 1857.

Gas Manipulation ; Banister ; 1st and 2d editions ; revised by Sugg ; 1863–1867.

Chemistry of Gas Manufacture ; Bowditch, 1867.

Methods for Determining the Density and Specific Gravity of Coal Gas ; W. W. Goodwin, Philadelphia, 1875.

Gas Analysts' Manual ; F. W. Hartley, London, 1879.

The Quantative Estimation of Ammonia and Sulphur in Coal Gas ; W. W. Goodwin, 1876.

The Gas Manager in the Laboratory ; "A Practical Student ;" London, 1881.

Technical Gas Analysis ; Winkler & Lunge, 1885.

The Gas Engineer's Chemical Manual ; J. Alfred Wanklyn, London, 1st and 2d editions, 1887.

1. Out of print.

The Physical Properties of Gases; Arthur L. Kimbel, Boston, 1890.
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Discussion.

The President—Are there any suggestions to be made on this very interesting paper?

Mr. McDonald—The paper is so complete, I hardly think anything could be added to it. I am heartily thankful to Mr. Shelton for the interest and labor taken by him.

Mr. Jenkins—The paper suggests a library for the Association, and we have a splendid start for one. Let us discuss right here and now to decide whether to have a library or not. Speaking for myself, I believe it would be a most valuable thing to have the Association get together a library to which its members could at all times refer for the information that they desire. Now and then, through the course of the year, I need just such information and do not know where to obtain it. Recently I had occasion to put together some statistics, and spent several hours several evenings in attempting to secure just what I could have found from an index as proposed here, and probably by wiring the Secretary could have had the second day the book and information that I wanted. I think there are very few of us who do not have such questions come before them and I think this library is just the thing we need. A good many have small libraries that in a way will help them out, but a general library on all classes of illuminating gas I think is indispensable. I wish to suggest one more topic that I see has been left out that at this periodis a very important sub ject—the subject of municipal control. I do not say municipal ownership, but municipal control, because we ought to know those writing on that subject. We can take the other side, if we want to do so, but if we have that in our library, and these matters are sprung upon us in our various localities, it would be very valuable to our companies. I am in favor of this Association taking up the work right here and providing an annual fund for the maintenance of a library.

Mr. Miller—It seems to me the work of indexing referred to by Mr. Shelton is a serious one when done as he intends that it should be and as it can be. It occurs to me, though, that it would take a long time for one man to make such an idex. The Thompson Library contains about 150 volumes, and it seems to me the books contained in it should be distributed amongst the members, who would like to attend to it, so that each one might furnish an index of what any particular volume contained in respect of specific topics. Then the Secretary could, from such inspection furnish a general index to each volume, thus con densing the index of the subjects treated of in the different volumes of the library accessible to the entire membership.

The President—It seems that the acquiring of this starting point of a library has much widened the field vista of the past work and use fulness of our Association, and it would further seem that any action, other than that which has been taken by adopting the suggestions of the Library Committee, if it is to be taken now, should be in the line of expressing the desire of the Association as to the uses to which this library should be put, and then intrust the Committee with the duty of carrying out those wishes.

On motion of Mr. McDonald a vote of thanks was tended Mr. Shelton for his paper.

The Association adjourned, to reconvene at 10 A.M. the following morning.

SECOND DAY, MORNING SESSION—MAY 16th.

The proceedings of the second day were commenced by the reading of the

REPORT OF COMMITTEE ON NEXT PLACE OF MEETING.

Mr. Z. T. F. Runner, on behalf of the Committee, said the unanimous choice was Indianapolis, Ind., through a very kind and cordial invitation on the part of Mr. John Somerville.

The report of the Committee having been accepted and adopted, Mr. Somerville said: I give to the Association a very cordial welcome to our beautiful city, which is about all we have to show you. We cannot visit a plant like that of our friend Barret's every day. Our works are a little old-fashioned, and because circumstances over which we have no control have been against the extension of an artificial gas plant, for as nature has been very bountiful in supplying us with natural gas, we cannot do very much in the way of showing you anything new or any improvement in the manufacture of gas, but we will try and make up for that. The Commercial Club, and all the other clubs as well, will, I am sure, do all they can to make the Association comfortable. The hotels, being all in a group, are in easy distance of one another, and they are very good hotels. I am very glad indeed you have adopted the resolution, and we will do everything we possibly can to make you perfectly welcome.

The President then introduced Mr. George McLean, of Dubuque, Ia., who read the following paper on

TAXATION OF GAS COMPANIES.

In the taxation of gas companies the rule followed should be that applied in the taxation of private corporations, firms or individuals. The spirit of this doctrine is affirmed in the Fourteenth Amendment to the Constitution of the United States, which provides that "No State shall make or enforce any law which shall abridge the privileges or immunities of citizens of the United States, nor shall any State deprive any person of life, liberty or property without due process of law, nor deny to any person within its jurisdiction the equal protection of the laws."

I do not mean by this allusion to imply that the State is without authority to tax franchise or intangible values. I admit that franchise or intangible value is property. And I admit and aver that, if a gas company is not a manufacturing corporation (the real estate, materials and moneys and credits *only* of manufacturing corporations are taxable under Section 1319 of the Code of Iowa), its franchise or intangible value is subject to taxation under Section 1305 of the Code of Iowa, providing that *all* property subject to taxation shall be valued at its actual value, and shall be assessed at 25 per cent. of such actual value, as well as under Section 1343 of the Code of Iowa, which makes special provision for the taxation of gas companies, and Section 1323 of the same Code, providing for taxation of shares of corporation stock.

It is not my purpose here to find fault with the laws of Iowa, nor to attempt to show that their spirit is not that of equality before the law. My quarrel is with those who deny that equality before the law is just, and who contend that inequality should be substituted, and with those who would deny the public service corporation the immunities or exemptions which, in practice, though not in law, are conceded to all others, and who would thus establish inequality in fact while preserving equality in form.

I propose to argue neither for nor against taxation of franchise, good will, or business in hand, or in prospect. It is my purpose to contend neither for nor against taxation of intangible values. My proposition is merely that the privileges and immunities of all citizens, whether public service corporations, private corporations, individuals or firms, should be equal; that there should be one rule for all. If we are to tax intangible values, let us tax all intangible values, and if we are to exempt any let us exempt them all. If market value is to be the basis for assessing one property, let us follow the example of the New Zealander and assess all property according to the same rule.

Do I hear objection? Yes. It comes from those who advocate what they call taxation of franchises, and whose views have been incorporated into the laws of several States. What do they demand? Simply this: That the law shall be enforced against public service corporations, but shall not be enforced against others. Is this a fair statement of the issue? Yes; at least as far as my own State of Iowa is concerned.

As I have already stated, the Iowa revenue laws provide that all property shall be listed at its actual value and assessed at one-fourth thereof. It is admitted that if this law were impartially enforced the public service corporations of the State would pay less taxes than they pay now. It is also admitted that the law is not enforced against these corporations, but that the board of equalization in assessing them takes into consideration the fact that it is not enforced against others. The demand is for a method of assessment applicable to public service corporations only, which will prohibit the board of equalization from taking this fact into consideration; a method that will deprive it of all discretion in dealing with such corporations and will make it, in relation to these, not a board of equalization but a board of computation. It is asked that the board shall be required to base the corporation's assessment on the market value of its stock and bonds, provided it is a

franchise holding corporation, while local assessors shall continue to exercise their own discretion in listing the property of all other citizens. It is admitted that local assessors commonly exempt intangible value, while under the stock and bond method of assessing public utility corporations this intangible value would necessarily be included.

The demand for a change in the method of assessing public utility corporations admittedly rests on the theory that their intangible values should be taxed and other intangible values exempted, on the theory that they should be denied the immunities which, in the exercise of the local assessor's discretion, would continue to be extended to all other citizens. The purpose is admitted of denying them the equal protection of the assessor or board of equalization, and to maintain the fiction of according them the equal protection of the law, by maintaining on the statute books the provision that *all* property shall be valued at its actual value and shall be assessed at 25 per cent of such actual value.

Now, why should the public service corporation be denied equality before the assessor? Several reasons are commonly assigned. First, it is alleged they hold special privileges. Of this allegation it may be said that, if true, all privileges granted to a public service corporation are parts of a contract between the public service corporation and the public authorities, which contract is presumably for the public interest and benefit; but the allegation is untrue as far as Iowa is concerned The United States Supreme Court defines special privilege as exclusive privilege. Public utility companies in Iowa may not be granted exclusive privileges. The State charters all who apply to build a railroad, and the city councils, and the people in their own discretion, determine how many companies applying shall be chartered to serve light, telephones, water, etc., to the public. The owner of a patent on a machine or process, or of a certain brand of goods, or of a membership in some voluntary association, is the holder of a privilege you or I may not exercise, as we may exercise the privilege of building a railroad, and he is not taxed upon it, though the prosperity of his business may be founded upon it. When the assessor enters the steel factory, or the cigar factory, or the newspaper office, he inquires not the value of the patent on a rail, or of the brand of a package of tobacco, or of the franchise in the Associated Press. He inquires merely the value of the stock on hand and of the physical property used in the operation of the business. Yet, if privilege be the test, the manufacturer's or publisher's claim to exemption is less than that of the public service corporation; for he holds exclusive privileges, while the public service corporation commonly does not. A gas works is a manufactory, and a gas company should be assessed as a manufacturing corporation.

But it is alleged the privileges held by public service corporations are unusually valuable, the excessive profits resulting from which are represented by the capitalization over and above the cost of reproducing the physical property used in the operation of the business. I deny also that this is generally and necessarily true. Taking the history of pub lic utility enterprises in my own town of Dubuque as a guide, I find that the failures have far exceeded the successes in number, and that the capital invested in puplic utility enterprises in that city during the past 30 years has not, as a whole, earned the prevailing rate of interest on well secured real estate mortgages. Moreover, capitalization is not an unerring index to profits. When, after risking in the undertaking for tunes large or small, and conducting it for years with an ability that would bring success to any enterprise, when because their skill, energy and vigilance have grown two blades of grass where only one grew before, the managers of a public utility corporation have secured a modern plant in good physical condition, and are giving a good service at low and stable rates to a largely increased number of patrons, their corporation can ordinarily float at par all the stock on which it can pay the rate of interest current for stable securities. On giving earnings, for example, it can float, possibly, twice as much stock as a newspaper corporation whose earnings on a given investment no one considers excessive. Now this fact, no more than the fact that our government's untaxed 2 per cent. bonds are at a premium, is prejudicial to the public interest; but in it lies the explanation of the willingness of so many to make investments in public utilities, the failure of which, unlike failures in many other lines, generally means the loss of almost the entire investment. Investors are tempted to engage in these ventures through the knowledge that, if they are reasonably successful, they will be rewarded through ability to effect capitalization of the earnings. A 2 per cent. tax on capital would destroy this hope and drive them into other fields in which the risk is not so great, and in which the State has not adopted the policy of penalizing or fining the successful.

It is not denied that capitalization may represent excessive profit in some cases. The contention is that it does not in all cases, and that, therefore, the proposition to apply the franchise tax in all cases is unjust. Where it is complained that profits are excessive in the case of certain public service corporations which are abusing excessively favorable franchises by robbing their patrons, the demand is not that the robbery shall cease, but that the owners of unimproved corner lots, or profitable business property, shall be given a share of the swag, that they shall be permitted to shift their tax burdens, in part, from their own shoulders on to those of the public service corporations, not only those which have been inordinately successful, but those also which have been only moderately successful, and whose earnings in proportion to investment are perhaps 50 per cent. less than those of the manufacturer clamoring for the franchise tax. It is contended that the franchise tax is expedient because the public service corporation is planted and can't get away? But the capitalization it is proposed to tax not only can but would get away; for a 2 per cent. tax on intangible value would not only destroy a large part of it, but would retard the creation of more, by discouraging fresh ventures in the line of public utilities. Let the theory that the value is necessarily inherent in the franchise, that the "franchise value" so-called is a gift of the people, obtain recognition in the laws of our States generally, and we will have a public policy that would logically justify the State in confiscating the profits of the merchant, derived from trading with the people of the State, and a policy which must inevitably arrest the development of these public utilities in the small cities and towns, whilst perpetuating high rates in the crowded centers of population. For who will make a venture in this line in the face of a public sentiment holding that if the venture fails he must bear the loss, while if it succeeds all value created over and above the value of the physical property shall be subject to a tax from which others are exempted? If public service corporations are to be allowed only the current rate of interest on the value of the physical property, would it not be wiser to invest in mortgages only and thereby avoid risk? And if the so called "franchise value" is the gift of the people, why tax it? Why not confiscate it?

The demand for a "franchise tax" is, perhaps, most popular just now among those who have nothing to gain and something to lose from the laying of the tax; that is, from the landless millions of the cities, and from the man with the dinner bucket and the rented house. He has been led thoughtlessly to believe a "franchise tax" would be for the public interest. The public interest lies in rates and service, in obtaining the maximum of service at the minimum of cost; and, as the tendency or effect of a franchise tax is to increase or to maintain rates to the tenant for the benefit of the landlord, therefore, it is not in the public interest.

The abuses out of which the demand for a franchise tax has arisen may be traced to charters which were not properly guarded by the agents of the people. Therefore, if we wish justice done let us withdraw discretion, not from the board of equalization, but from the boards heretofore entrusted with the duty of guarding the people's interests in the contracts made with public service corporations.

Laws which give the landlord an interest in maintaining rates of public utility corporations to the tenant are not in accord with sound public policy, and sound statesmanship will condemn them.

Discussion.

The President—This very interesting and able paper should bring out a brisk discussion.

Mr. Enright—As I understand the situation at the present time in Iowa, the gas and electric companies are in the hands of a proposed State Board of Equalization or something of that sort, for the purpose of having their properties, or, in other words, having their franchises appraised by different kinds of assessors. Is that true?

Mr. McLean—The Iowa statutes now provide that the tangible property of corporations, such as gas companies, be first assessed; that is, that the corporation's real estate and personal property be first assessed, and that its capital stock be further assessed for the difference between the value of the corporation's real estate and personal property, and the total value of its property, tangible and intangible, as indicated by the value of the corporation's capital stock. This additional tax on capital stock is a franchise tax, as they call it, or a tax against the intangible value of the corporation.

Mr. Enright—What do they propose to do with the endless number of franchises in that State that are not perhaps worth the paper upon which they are written?

Mr. McLean—If they can show they are not worth anything they will not, of course, have to pay the tax.

Mr. Enright—I don't think there will be anything to tax as some

little towns grant franchises. That suggestion came up in different States, and last summer both parties in Missouri were pledged to what is called a franchise tax law. The first bill introduced, if I remember correctly, contained a great many of the Iowa features. That bill was defeated after a very hard fight. The next bill had some of the objectionable features eliminated, but after a very stubborn fight that was also defeated; in other words, neither of the bills passed. Then after an interval of 2 or 3 weeks another bill was presented which went through and became a law. Under this new law the different franchises of gas and electric companies are appraised by the County Assessors. If you are not satisfied with the appraisement you have the right to appeal to the county board of equalization, and if the decision is not satisfactory you can refuse to pay the tax and have it tested in court. The objectionable features of the different bills presented were defeated by the stubborn fight put up by the different railroads, telegraph, telephone and other companies. If the gas companies of the State had a hand in the defeat of those objectionable features I have not heard of it. I would like very much to be able to state that they did. I must say the matter does not give us any particular apprehension. We are perfectly willing to meet anything that is reasonable, and feel greatly obliged to the different companies who stubbornly fought the unjust features of our law and finally succeeded in defeating them. I am sorry the same conditions are not prevailing in Iowa.

The President called upon Mr. Pratt:

Mr. Pratt—I have very little to add. I heard Mr. McLean's statement, and have discussed the proposition somewhat with him—Mr. McLean and myself come from the same State. Mr. McLean is a student of this question. I certainly take no issue with anything that he said in the paper. It seems to me it is very profitable and very fair. To a person who has lived in the East, especially in New England, the matter of Western tax laws is often very peculiar, and I must admit, with my 14 years' residence in Iowa, I have hardly yet familiarized myself with the methods employed there. I can remember that in New England if a person wanted to buy a piece of property, to ascertain its value it was only necessary to go to the books of the assessor to be convinced in his own mind of the fair and equitable worth of that piece of property. But if I were to undertake to find out that same information in some of our Western States, more especially in my own State now, I think the assessor's books would be the last place I would go to for that information. I think Mr. McLean has stated very concisely the methods of making these assessments. I think the average gas man, or the average individual having any property interests, will make no objection to honest and equitable assessments. It is simply a question of deciding for, or assisting in the decision with, the assessor wanting to get a fair and reasonable valuation. It seems to me there is a great deal of guesswork, and in my judgment most of these assessments or valuations are made up in offices without even the pretence being made of going out to examine the property to be assessed.

Mr. T. D. Miller—One phase of this subject of assessment Mr. McLean touched on here I think cannot be too much emphasized. I happen to be familiar with an assessment of a franchise in a certain State, that will be nameless, in which an effort was made to assess the franchise of a press association and express companies. I will use the express companies for illustration. Three or four express companies doing business in the State showed by their statements the amount of money they made on the business done in the State, no interstate business being included at all. Their real values of tangible property were somewhere in the neighborhood of $20,000 or $30,000 in the State, but they showed a profit of something like 200 or 300 per cent. on the actual investment in the State, and an effort was made to assess these franchise values on a basis of 6 per cent. on the valuation. The excess of the 6 per cent. on the real values was to be called a franchise value, and they were going to assess the franchises at that value, which would be the assessment on a company with $20,000 invested and $50,000 profits. The Wells-Fargo Company Express appeared before the board and said, "Gentlemen, we are not a corporation. We have no franchise that you can assess." The Pacific Express Company and the American Express Company were corporations, so they could not make a like defense. They admitted the correctness of the Wells-Fargo Company argument, that private individuals had no franchise, therefore, that they could not be assessed on a franchise value, but these corporations did own a franchise precisely similar in every way to the private holding. Just what the outcome will be in the Courts finally is not determined. But it looks to me very much like they have either got to assess the private express company or let the incorporated company off. Another case was concerned with certain mercantile agencies down there—one of which is a corporation and the other one is not. The same question was presented. Now I see Mr. McLean says that they assess the property at 25 per cent. of its actual value. That is a queer way of assessing property, it strikes me. Where I came from they assess it at its full value; sometimes they get above it. Respecting the matter of goodwill. On the basis that Mr. McLean treats the question, if the goodwill of every man's business was assessed it would be all right; but there is the goodwill of a corporation, and here are two corporations doing business in the same town, with identically the same fields for work. Probably one of them, being incompetently managed pays no dividend, consequently it has no franchise value, but the other one which is competently managed pays a good dividend and has a franchise value. I submit it to any fair minded man that that is not a taxable value. You might as well go out and tax lawyers on their income, because a man that is a good lawyer and gets a handsome income from his practise on that theory ought to pay a tax on his earnings. In other words, a theory of that kind puts a premium on idleness and a discount on the activity that has made America famous. I believe some of these propositions as to the state of affairs in Iowa are not peculiar to that State, that the law should be enforced against public corporations but not interfere with merchants. For instance, that corner over there will rent for $5,000 a year, and it has consequently a higher value in the eyes of the assessor. It has been argued that the man has to pay for the franchise value of that property. What gives it that value? It is the amount he can rent it for. Out of this rent that he gets he pays the taxes, and the man who pays that rent for it would not do it if the business he could do on that corner did not justify it. Everything contributes to pay that tax as a matter of fact. The man who does business on the corner is the man who pays the franchise tax; while it is indirectly paid, it is paid just the same. Therefore, the franchise value there does contribute to the taxes. Another thing in regard to the franchise value of property. A gas company has a plant, and as I understand it here, it means a plant in more than one way. It cannot be removed; once down it is there for good. Take that plant and deprive it of its franchise or of its right to do business, and it is not worth taking up. It is hardly worth its junk value. It would cost nearly as much to market it as it would be worth when it would be marketed. Therefore, when the gas company's mains are taxed or assessed at their value, the franchise of that company is considered in that taxation. There may be some more franchise value to be assessed, but nothing like the amount referred to in this paper as being appraised; that is the difference between the tangible value and market value. I cannot recall a case now where a turnpike company or any other such corporation was assailed and taxed in that way, that went to the Supreme Court of the United States, and the Court held it was legitimate that they should be taxed in that way. When this franchise matter came up in our State I got an opinion from our attorneys who said, you have to pay the franchise tax. Then I asked, how will we arrive at the value. They said, any way in the world, just so you get it as low as possible, because any means of arriving at the value of a franchise seems to have been sanctioned by the courts of the country. It doesn't make any difference how they arrive at it, just as soon as they say that is your value, however, they fix it, the courts seem willing to sustain it. He said, it looks like they can tax you anyway or anyhow and as long as they please as long as you are a public corporation. Why not confiscate the franchise if it is the gift of the people? Unfortunately it seems to be the disposition of the country to try the confiscation plan. I have given some study to this, and unless some means other than a directly antagonsitic fight to this disposition is found that sentiment is going to grow. I size it up this way, that the franchise owner or the public is either going to exercise his own franchise or he is going to control it in some way or other. It seems to me the problem now is to find some way that he can control it to an extent that will enable him to realize something out of its exercise.

Mr. Enright—There is many a good feature in Mr. McLean's paper. Say, for instance, the constant howl made in regard to the exclusive and special rights of gas companies. As I understand it, we have no special or exclusive rights. The majority of us simply have an ordinance passed by a city council that gives us a franchise to do business, and there is nothing on earth to prevent them in two weeks from giving the same thing to another fellow. Of course, matters of this kind vary materially in the different States. In our State, as I understand it, our new law has no reference to the real and personal property of the different corporations that are being handled in the old and regular way, but it is simply a new and special law taxing franchises. I have

talked with several owners of companies throughout the State and they do not seem to have any objection ; on the contrary, they seem to think the majority of people in many localities will find out there is not as great an amount of value attached to those invisible things as they now believe.

Mr. A. E. Forstall—In closing his remarks, Mr. Miller said something that I was very glad to hear him say. It followed just in line with what I said to this Association at its last meeting, that the time was soon coming when we would be controlled, whether we liked it or not. I went on to say that in view of that state of affairs we had better see that the control was exercised in a shape in which we could get something out of it. If we do not, it will be exercised in a shape in which we cannot get anything out of it.

Mr. Jno. D. McIlhenny—On the question of taxation of gas companies, it may be interesting to note that, in a certain State in this country, a bill was recently introduced to tax the capital stock of gas companies 5 mills upon the dollar. Up to this time the bill has not been finally acted upon by the legislature, but a very fortunate expression was made regarding the tax, and in a line it seems to me that gas companies will finally have to come. One of the influential gas companies in the State stated that if the tax were imposed the gas consumers would have to pay it, in that it would defer an equal reduction in the price of gas, or possibly cause an increase in its price in various localities. In other words, should gas consumers and the public generally be caused to understand that they will have to pay a tax imposed upon gas companies or other corporations there will be less clamor for its imposition.

On motion of Mr. Miller a vote of thanks was tendered to Mr. McLean for his paper.

Election of Officers.

The President announced that the election of office bearers would be the next business in order. Messrs. C. M. Keller, J. D. McIlhenny, Jas. Forbes and E. E. Eysenbach were appointed as tellers. The result of the balloting was as follows :

President—Mr. Thos. D. Miller, Dallas, Tex.

First Vice President—Mr. A. H. Barret, Louisville, Ky.

Second Vice President—Mr. F. H. Shelton, Philadelphia, Pa.

Secretary and Treasurer—Mr. J. W. Dunbar, New Albany, Ind.

Directors (to serve two years).—Messrs. Geo. F. Goodnow, Waukegan, Ills.; Wm. McDonald, Albany, N. Y.; H. L. Doherty, New York City ; John Gimper, Galveston, Tex.

Editor Wrinkle Department—Mr. Wm. E. Steinwedell, Belleville, Ills.

Some Responses.

Mr. Miller, in responding to the announcement of his election, said : Gentlemen of the Association, I hardly know how to express myself to adequately convey to you my appreciation of this honor, because I do regard it an honor to be singled out by such a body of men as their presiding officer ; and I sincerely express the hope that I may merit the confidence and esteem expressed by this vote. I thank you, gentlemen, sincerely.

Mr. Barret did not say anything.

Mr. Shelton said—I may just frankly say that I appreciate and enjoy greatly the compliment you have just paid me. I feel also that it is a particularly pleasant action on the part of the Association (with our membership made up from an extended area, South, North, and West, and East) for the East to be represented in the officers of the Association. I think as an Association act it is exceedingly gracious to thus recognize the far-dwelling portion of the membership. I do not feel, however, that I am only an Easterner. I have been in the West a good deal, as you know. I have spent several years in Chicago, losing some hair there, and gaining some experience. Furthermore, many of the best friends I have in the business I made in the West. I feel that, having thus lived in the West, and with two or three substantial business interests that I have now in Indiana and the Mississippi Valley, I am almost as much a Westerner, as far as being a gas man is concerned, as I am an Easterner. I have always "pushed" for the Western Association, and I always expect to. I think, further, that it is a reciprocal duty for a member if he becomes one of the managers or officers, then to push all the harder, and I certainly will try to reciprocate your courtesy by pushing all the harder for the uplifting, broadening and pushing ahead of the Western Association.

Mr. Dunbar said : Gentlemen, it is with pleasure that I receive this continued evidence of your confidence, and I trust I will fill the position in a manner acceptable to all, and that, as Mr. Shelton has just expressed it, the Association, with the aid of the new members that we have elected at this time, and by the assistance of the additional amount of push and energy that Mr. Shelton will instill into us all, we may go forward to new fields of conquest, and may ultimately reach that state where we will be an Association the peer of any other in the world. I thank you, gentlemen, very much.

The President introduced Mr. A. H. Barret, Engineer of the Louisville (Ky.) Gas Company, who read the following

MEMORANDUM OF SIX MONTHS' OPERATION OF INCLINED RETORTS, FOR THE MONTHS OF OCTOBER, NOVEMBER AND DECEMBER, 1900; AND JANUARY, FEBRUARY AND MARCH, 1901.[1]

Coal carbonized (approximately)	25,000 tons.
Coke sold per ton of coal carbonized, including lump and broken	24 bushels.
Tar sold per ton of coal carbonized	13 3 gallons.
Ammoniacal liquor sold per ton of coal carbonized	220 liquor ozs.
Average candle power for the entire period	17.42
Coal carbonized per stoker	10½ tons.
Labor per ton of coal between storage and the bins, including crushing and distribution	7 cents.
Coke labor per ton of coal carbonized ; being all labor from the discharging of the retorts to the storing of the coke, including quenching and other labor incident to the transportation	6.6 cents.

The average yield per pound of coal has been from 4.60 to 4.70 cubic feet. The grade of coal used has varied from "mine run" coal to 50 per cent. nut and slack ; and also, from Pittsburg coal to some very low grades of local coal. No trouble from slipping has been experienced, except from occasional pockets of dust, either dry or wet. A part of this candle power is probably due to the fact that some of the local coal carried a streak of cannel, which "boosted" it up a trifle. I think, though, without that aid the candle power would have been 17.

Discussion.

The President—The statement of facts from Mr. Barret, which is not the less valuable because of its briefness, is before you for discussion. I think a little "experience meeting" is in order now, and we would be glad to hear from any who have a desire to debate the subject.

Mr. Steinwedell—Mr. Barret, was the 24 bushels of coke a weighed or measured bushel ?

Mr. Barret—2,688 cubic inches, measured bushel. We measured it all.

Mr. Steinwedell—I would like to know whether in Mr Barret's experience he found the yield per cubic foot in inclined retorts was greater than with horizontal ones ?

Mr. Barret—I do not really see any difference in yield. The grade of coal we are now using is so much inferior to what we were using with horizontals that I was prepared for an apparent decrease in yield. You take a good grade of screened coal as compared with nut and slack, and you have 15 per cent. less available coal in it.

Mr. Steinwedell—About what yield would you get with this grade of coal in the inclined retorts as you are running to-day ?

Mr. Barret—We are getting now from 4.60 to 4.70.

Mr. Norris—With departures from conventional lines difficulties are always experienced, and if it comes within the scope of discussion at a place like this, I think it would add very much to our information if Mr. Barret would consent to give an account of the difficuities, structural and otherwise, that he has encountered in bringing the plant to the present method of running, and how he overcame those difficulties. If the rest of us should put in inclined retorts we would like to avoid some of those difficulties.

Mr. Barret—I hardly know how to answer the question, for the simple reason that the difficulties were so few. Having demonstrated the fact that the charging apparatus was all right, and that we had adopted about the right grade of coal, there was nothing left except to heat the benches uniformly, and to get rid of the coke. As many of you who have seen the plant no doubt observed, when a bench is discharged there is every appearance of a pretty bad charge coming out, and for some little time that disturbed me a good deal or until I found it was simply unavoidable. There is always more or less tar in the mouthpiece, which tar, dropping on to the coke chute, spreads itself, and as it is immediately followed with this charge of hot coke it flames

1. Mr. Barret prefaced his memorandum with the following words: Mr. President and Gentlemen—In presenting this paper to you I thought I would omit any description of the plant, since last fall, at the Denver meeting of the American Gas Light Association, I read a description of it, and doubtless most of you have read it. In addition to that, the interest centers entirely on the detail of the results that are being obtained.

up as any of you may have noticed when there, just as when you throw a small lump of tar into the fire. That creates a very bad impression and is objectionable, but I do not see how we are going to get rid of it. There had been a good many suggestions made by my friends as to how to get rid of it. I expect those who have operated coal gas works know what class of labor they have, and anything that can be broken up and thrown away is broken up and thrown away, so you must strike an average result of what you can get from it with the smallest amount of repairs. I think the heating problem is perhaps the most trying one. The requirement in the matter of attention to the heat is greatly in excess of horizontal benches, simply for the reason that you are dependent on the charge being fairly well burned. We have our off days, like any other furnace or bench has its off days, due to the barometric or vaporous condition of the air, or what not, but it is more perceptible with us, and requires nicer nursing. In horizontal retorts with mechanical stoking, if the bench is a little off it does not make much difference, but in this it does make a difference, or the difference is very much more apparent. It is harder to get off. If the charge is half burned, with mechanical stokers you have the power to pull it out; with this it would be quite ugly. The essential requirement in inclined benches, as we know them to-day, I think is persistent and constant attention to your heating.

Mr. Odiorne—I would like to ask Mr. Barret if he ever used coal slack or other fuel than coke in the generators?

Mr. Barret—No, sir; but for no other reason than an economic one.

Mr. W. A. Miller—I would like to ask Mr. Barret to state the increased percentage—yield of gas per man—due to the operation of the inclined compared with horizontal?

Mr. Barret—On the same basis I should say that the yield has been increased about 2¼ to 2½ times—225 to 250 per cent.

Mr. A. E. Forstall—Was the candle power determined on a flat flame or an Argand burner?

Mr. Barret—An Argand burner.

Mr. Steinwedell—Figuring 40 pounds to the bushel, 24 bushels of coke would make 960 pounds of coke sold per ton of coal carbonized; 370 pounds of coke to the ton used for firing, with no allowance for waste, which is just 18½ per cent. for firing the furnace, shows a pretty good result.

Mr. Barret—The figures are based entirely on measurement and on results as the 6 months' work has shown, without any deductions. I am not making any comment as to where any discrepancy may come in. That is the result of actual measurements for which money has been obtained. Whether it is 16 or 26 does not cut much figure except as a specific operating result. I think we have obtained a great benefit in the amount of coke available, and perhaps the consumer may be paying for some of this in having more lump coke for sale, partly due to the inclined system in not breaking up the coke so much, and partly due to our method of handling. I did not go into the per cent. of coke used at all; I left that out intentionally.

Mr. Steinwedell—You handled it just as they do in England; figured so many bushels of coke sold?

Mr. Barret—Yes.

The President—How much coke will a ton of coal yield?

Mr. Barret—I have not figured that at all. I have ignored that. I am essentially interested in what I can sell from a ton, not what I can produce from a ton.

Mr. Cowdery—You do not sell breeze, and do not include that?

Mr. Barret—No, sir; we did not include that in the coke sold; as specifically stated it was egg and lump coke.

Mr. MacBeth—I believe the average length of a charge is 5 hours. I would like to know if this was the average, or what it was?

Mr. Barret—We are running 6 hours, on 750-pound charges.

Mr. Norris—I would like to ask Mr. Steinwedell how he figures out a coke consumption of 18 per cent. I cannot make it 18 per cent. any way I figure, unless he means by "per cent." the Continental practice of figuring pounds of coke per 100 pounds of coal carbonized.

Mr. Steinwedell—That is the way I figure it.

Mr. Norris—Mr. Steinwedell's method of putting it seems to me to be misleading, as not in accordance with ordinary American practice.

Mr. McIlhenny—I would like to ask Mr. Barret if coke was used for other purposes about the works which was not included in the coke sales.

Mr. Barret—Nothing but the breeze, essentially.

Mr. Norris—Another question I would like to ask in regard to the grade of labor employed. Does Mr. Barret find it wise to pay the same wages per day or per hour as when he was using the ordinary horizontal retorts.

Mr. Barret—We pay the same wages to the stokers. The wage question has been reduced materially by classifying the labor differently, and that has enabled us to use a proportion of cheaper labor, such as used in the coke and coal business; commonlabor rather than stokers.

Mr. T. D. Miller—I would like to ask if the hydraulic mains have worked satisfactorily?

Mr. Barret—Yes; we have had most gratifying results from them. Like all other good things, it requires some attention, and I expect our friend Mr. Somerville will criticise that a little bit, because it does require a little more attention than you can pick up off of the street. We send a man up and have the mains drawn once a day and refilled, and since we get the work systematized we have no trouble whatever with pitchy mains.

Mr. Beal—I happened to come in just in time to hear some talk about coke. It may be of interest to make a little statement which I find in a memorandum book. We used at our works during 1900, 11.89 pounds of coke to carbonize 100 pounds of coal, and this is about what our books show for the past 4 months, the actual figures being:

Coke made per 100 pounds of coal.....		70 pounds.
Coke sold.....	49.79 pounds.	
Breeze sold.....	9.08 "	
Used under retorts.....	11.13 "	
		70 "

It will be noticed that we weigh our coke, and it may be that 70 pounds of coke per 100 pounds of coal is a little high. If I am wrong about this, I would like to be corrected. How is that, Mr. Greenough?

Mr. W. A. Miller—Too high.

Mr. Beal—Mr. Greenough, how many pounds of coke do you get from 100 pounds of the coal you use?

Mr. Greenough—I think that is a good estimate. I think your figures are extremely low for the amount you use. It is a good deal better than I can do.

Mr. E. G. Cowdery—On the question of the amount of coke, I imagine some are laboring under what I would consider was a wrong impression. To judge from what I have seen, I would presume that Mr. Barret was producing 1,400 pounds of coke and breeze per ton used, and that there would be about 200 pounds of this breeze, and that there would be about 1,200 pounds of good coke. If he sells 960 pounds, that would leave 240 pounds used in his furnace. The percentage of good coke would be about 20; and the percentage of 1,400 pounds would be about 17.

Mr. T. D. Miller—I find, by careful weighing of the coke that comes from the coal we get in Indian Territory and Colorado, that it runs just a slight fraction under 70 per cent. of the coke returned from the coal; but of course the loss of breeze is quite considerable, and the softer the coke of course the greater the loss.

Mr. A. E. Forstall—In regard to the amount of coke produced from a ton of the coal we use, Westmoreland coal, we found the average just about 65 per cent. by weight of coke, which would make 1,300 pounds of coke for every short ton of coal. That was the result of several hundred tests in which we would weigh out 1,000 pounds of coal and charge it into 3 retorts, then weigh the coke from those retorts, hot, weigh it before a drop of water was put on it except just enough to put out the flame, so there was really no water in the coke when it was weighed. Sixty five per cent. would be a fair average of the result of all our tests. Mr. Cowdery in figuring the amount of coke sold by Mr. Barret has, I think, taken too high a weight per bushel. As I saw the coke at the works yesterday, it is, as Mr. Barret says, common lump, and lump coke will not weigh 40 pounds per bushel; 37 to 38 pounds is as much as it will weigh.

Mr. Barret—Regarding the coke matter some years ago, I was induced, by seeing other people selling coke by weight, to try it, and I started doing it. We had so much complaint and trouble (it was very satisfactory to us but not to our consumers, though), that I had to give it up. Now it is possible and probable that in measuring coke we still have some advantage over the actual conditions, but nothing like we would have if we sold it by weight; so these statements are based entirely on the measurements of actual deliveries in every day work.

Mr. Shelton—May I ask if you have any trouble with coal slipping in the retorts you are using.

Mr. Barret—We have had occasional trouble of that kind when we would strike a pocket of very fine dust—dust expresses it better than anything else. In filling the coal bins the coarse coal naturally rolls down, and conditions occur sometimes that give an accumulation of dust, and when that bin is emptied the end of it yields pretty fine stuff, and when it runs in we have some trouble both with charging and with

slipping; but that is negligible, for the reason that it only occurs once or twice a month, and holds good only as to 1, 2 or 3 retorts.

Mr. Shelton—Have you found any additional trouble from the increased length of standpipes? Is that something you would like to provide against in another installation?

Mr. Barret—Not particularly. I don't think the increased length of the standpipes has caused any additional trouble. We had some trouble when we started with stoppages in the standpipes, which I attributed to two causes: First, the excessive hot weather of last summer; second, the use of coal which has a tendency that way. But the trouble with stopped standpipes now is just about the same as it was with horizontals. Probably the records will show that the pipes will average not over 4 or 5 times with each watch. That means everything in the way of stoppage on each watch.

Mr. Shelton—Do you find you can scurf very easily?

Mr. Barret—Well, we find we don't need to scurf inside of 3 or 4 months, and when it is done it takes from 20 to 40 minutes, so practically there are no changes. I think that will add very materially to the life of the retort, for the simple reason that the carbon is not burned from the body of the retort. There is a good draught through to the retort. It collects at the corners of the retort and is just ready to slip off. I think two-thirds of the cost of short lives and renewals in the retort is due to this scurfing, and nothing else. In the old method of scurfing the horizontal retort, you burn the whole body of the retort, you take away all the carbon that has accumulated in there, which leaves it open and very friable. I anticipate a very marked increase in the life of the retort.

Mr. Greenough—One question I would like to ask Mr. Barret is: A good many others in the last few years have had very serious trouble with tar distillers on account of a deposit of carbon in the stills, due to what they call fixed carbon in the tar. I would like to ask, first, whether Mr. Barret has had any such trouble with his distillers, and if it has been increased since the use of these retorts. The second question I would like to ask is whether in his judgment it would be any more difficult to work those retorts if they were 10 feet long than if they were 18.

Mr. Barret—In the matter of tar, I would say I have had some experience with tar distillers like that mentioned by Mr. Greenough when using the horizontals. I have had no complaint with the inclines. I think that the length of the retort will be controlled by the ability to get a fixed grade of coal. I believe within easy limits if you can get screened pea coal you could use a 30-foot retort. I think the available length is dependent entirely upon your average coal, what it will pan out. That is shown just as I said about using the dust. The dust won't run as well; it packs and then it slips. With a fine, clean, nice grade of coal, like pea coal, you could use almost any length you chose.

Mr. Greenough—It would necessitate a different angle, though.

Mr. Barret—I think not. It is one of those happy combinations of natural laws that overcome any accelerated motion of this sort due to the small size of the coal. It does not gain headway as a larger body would. The resistance it meets when the coal begins to pile back is just enough to stop it. I don't know whether any of you have ever seen those retorts charged with the lower door open or not, but Mr. Huber will be very glad to leave one of them open and let you see it done, which will demonstrate what I mean very easily and very clearly. It is a very pretty thing. The coal runs down, you hear it packing up against the stopper, then it fills back against the line of the retort.

Mr. W. A. Miller—I would like to ask Mr. Barret, in using retorts 30 feet in length, what means would be suggested for repairing cracks or leaks in the retorts about the center.

Mr. Barret—I am not advocating 30 foot retorts. In practicable limits, it looks to me like 18 or 20 feet is about as long as one should go. If you make an 18 or 20-foot retort in 3 sections, the retort is available for patching from either end, but I would not advocate a 30-foot retort just for that reason. The question asked by Mr. Greenough, as I understood it, was as a matter of possibility not as a matter of practical desirability.

Mr. Somerville—I would like to state that I visited the Louisville works yesterday, and the whole installation excited my admiration. I congratulate Mr. Barret on building it and the results he is getting from it. I would like to ask him the simple question that if he were building again, would he build the retorts back to back? It seemed to strike me if there was any criticism at all, that these men between the retorts up there, when the outside temperature got up to 80° or 90°, would be in a very trying position, and I thought if I were building them I would rather, for the sake of the men and the other things, prefer single benches.

Mr. Barret—The question of construction is controlled largely by your local conditions. Not all of us in a case of this kind can control the amount of ground available. As to the complaint about temperature (80° or 90°), I would ask Mr. Somerville if he knows a coal gas retort house which in the summer is not over 80° or 90°. You cannot get that in the shade, so I don't think the heat is excessive except in excessively hot weather. The experience of last summer, which was most trying, indicated that the heat on that gallery was probably 6° or 8° above the surrounding atmosphere. That there are some faults in the ventilation of that building I am very free to confess it, due to a lack of appreciation of the demands for ventilation. You take the result of nine retorts all throwing out coke with reasonable rapidity from 3 or 3½ tons of coal, and you have got an enormous lot of smoke to dispose of very rapidly if you want to keep a clear atmosphere. It is not the inclined retorts that cause this smoke. A horizontal retort would do the same thing if you discharge the same quantity in the same time.

Mr. Greenough—I would like to emphasize what Mr. Somerville said. I visited these works yesterday with a great deal of pleasure, and I want to congratulate Mr. Barret and the Company behind him for the intelligence and courage with which they have made the first large installation of this sort in this country. Those of us who have struggled with other attempts to change ordinary methods of manufacture have always gone through with difficulties which have sometimes been costly and discouraging, and it required a great deal of courage for a gas company to spend as much money as has been put in here by the Louisville Company in the construction of that plant.

Mr. Steinwedell—Mr. President, Mr. Barret has furnished us with some very valuable data, and he is to be heartily congratulated on the results he has obtained. I move a hearty vote of thanks to him for answering our questions so readily and thoroughly, and for the results he has secured. (Adopted.)

Report of Committee on President's Address.

The Committee on President's Address made the following report, which, on motion of Mr. Z. T. F. Runner, was adopted:

To the Members of the Western Gas Association—Gentlemen: It is unfortunate that the conditions surrounding the meeting room were such that the reading of the President's address, and the subject matter contained therein, could not have been fully understood and, therefore, appreciated. We commend to your thoughtful consideration and careful reading this address upon your return to your homes, for it contains much that is beneficial, helpful and reassuring, inasmuch as it is the candid, thoughtful expression of a man upon questions and along lines in which he has been especially successful, and from whom we can safely take counsel. His enthusiastic suggestions as to how we can find a market for our product are only the reflections of methods long since employed by him, and many of us are only now adopting the ideas and the notions that were successfully introduced by him several years ago.

It is especially pleasing to contemplate that there seems to be no immediate limit to the use of gas, each year seeming to open up new avenues and new opportunities, and, with the President, we agree that the opportunity is before us to make its use within the districts supplied practically universal. Respectfully submitted,

Edward G. Pratt,
James Ferrier,
Geo. G. Ramsdell. } Committee.

A motion for recess was adopted.

[To be Continued.]

An Electrolysis Survey at Columbus, O.

Engineering Record reports that some time ago the Director of Public Works of Columbus retained Prof. F. C. Caldwell, of the Ohio State University, to make an electrical survey of the city. This was necessary because the new franchise of the Columbus Railway Company requires it to use the double trolley or an equivalent system, and the city wished to ascertain how well the requirement was fulfilled. In the course of this investigation many readings were taken throughout the city to determine the difference of potential between the pipes and rails. These indicated that where the bonding of the rails was in good condition the potential difference varied between small positive and negative values. Where the bonding was poor the potential was much greater, as is generally the case; but on the whole there was no point found where any considerable flow of current from a pipe to a

rail existed ; that is to say, there was no place where serious general damage by electrolysis seemed likely to occur, except near the power station, and even there the indications pointed to no immediate danger. A number of experiments were made, however, to ascertain the amount of current passing through the cast iron water pipes which might cause electrolysis at the joints. Through the kindness of City Engineer Julian Griggs, some extracts from Prof. Caldwell's report on this work are given here. The method used in obtaining the resistance of the pipes was as follows :

Between two points on the pipe under test, two No. 6 wires were stretched, in one of which was placed a voltmeter and in the other an ammeter and sometimes a cell or pair of cells, giving about 2 volts. From the readings of these instruments, the resistance of the pipe between the points could be determined approximately. The first experiments were made by connecting wires to hydrants, but the resistances thus found were so high as to cause suspicion that the resistances in the joints of the hydrant and the hydrant branch were considerable, making the apparent resistance of the pipe itself seem higher than it really was. Accordingly, the pipes were uncovered near the power house of the electric railway ; at other localities, two valves in the mains were found reasonably close together and tests were made between them. Four rods with drill points in their ends were prepared for the purpose of drilling into the tops of the valve stems and thus affording additional opportunities for experiments. In some cases a cast iron cap was set over the valve stem which did not always make a good contact, and to this was probably due the apparent high resistance in many tests. These questionable results have not been used in calculating the currents in the pipes, however, and in Prof. Caldwell's report only such readings were used for this purpose as gave resistances low enough to indicate good contact in the valves. The accompanying table gives the results of the tests :

Table of Tests of Electric Currents in Columbus Water Pipes.

Diameter, Inches.	Length, Feet.	Difference of Potential, Volts.	Resistance, Ohms.	Current, Amperes.
4*	300	1.2	17.0	....
6	430	0.35	14.3	....
6	60	0.02	290.0	....
6	500	0.10	0.66	0.15
6	640	0.02	0.007	3.00
8	700	3.6	76.0	....
8	150	0.08	0.034	2.00
8	180	1.9	13.5	....
8	510	0.2	175.0	....
8	260	0.17	0.06	3.00
8	660	0.37	0.05	7.00
12	700	0.52	0.065	8.00
16*	300	1.0	9.0	....
16	60	0.02	0.007	3.00
20*	180	0.00	1.1	0.00
20‡	350	0.5	0.13	4.00
24*	900	2.3	6.7	....
24‡	350	1.4	....	....
24†	350	0.4	206.0	....

* Connected on hydrants. † Connected on branch valves. ‡ Connected directly to the pipes. All other readings were made on main valves.

The recommendations made in the report are as follows :

1. The railway company should be required to install on all parts of its system within the city limits, thoroughly good systems of bonding, including cross-bonding between all the rails, and to maintain all bonds in good condition. This would insure that the drop on all lines running out from the center of the city would be very small, because, there being but a few cars at any one time on each line, the total current flowing through the rails of such lines would be small.

2. The company should be required to so extend and maintain its present system of insulated return feeders that the drop of potential along the rails, especially where the currents are large, shall be kept as low as practicable.

3. The ground connection at the power station should be removed, and the resistance between the negative terminal at the generators and the earth at the station should be kept as high as practicable.

4. In all future track construction and reconstruction, the rails should be, so far as practicable, surrounded by concrete or similar material which, being a poor conductor, will increase the resistance from the rail to the earth, or some other construction should be adopted to accomplish the same purpose. This will require little, if any, change in the best methods of track construction now in use.

5. No bonds or metallic connections should be allowed between the water pipes or any other pipes or metallic conductors except by special permission.

In making these requirements, particularly the third, the city should be careful to so state them, perhaps as provisional alternatives to a completely insulated return circuit, that in case electrolysis develops hereafter the railway company will not be able to prove that it was the result of the requirements of the city. This point is particularly important with the third requirement. The earth connections at the stations are now maintained to prevent the current leaving the pipes at the points where the return feeders are attached. Removing these ground connections may result in the pipes becoming slightly positive to the rails at or near these points. It is believed that if the first and second requirements are properly carried out, the flow of current will be negligible, and even if this be not so, it is better to have the damage concentrated at a few points where it can be watched than distributed along many of the joints of the large mains.

Professor Caldwell advises carrying out the third recommendation immediately, but until the first and second recommendations are also carried out, he believes the company should be allowed to make temporary metallic connections from the pipes to the return feeders at or near the points where the feeders are attached to the tracks. Frequent tests should be made over the whole street railway system to determine the condition of the bonds.

With regard to the water pipe systems, three suggestions are made. First, the new pipes should be laid so far as possible in alleys, and if it is necessary to place them in the streets they should be laid as far as possible from the track. Second, in laying the pipes the bells should be placed toward the direction in which the current will flow if it is present. Thus, if any slight electrolysis should occur, it would generally be in the ends of the bells and would not be so likely to make trouble. Third, care should be taken in the leading and calking of the joints not to injure the coating on the pipes, and after the joint is complete, the lead and the pipe for 6 inches on either side of the joint should be given a coating of asphaltum.

One common misconception is corrected in the report, namely, that the return of the current through the pipes in the streets is of advantage to the railway companies. When, owing to bad track bonding, much current is forced through the pipes, it means, on account of the loss of power entailed, bad management from the point of view of the railway. Moreover, such current as leaves the rails will cause a corrosion of the rails themselves, and where the currents are large it results in a serious eating away of the metal.

Green Sand Cores.

In a paper on this topic, read by Mr. P. R. Ramp, before the American Foundrymen's Association, the author said : A green sand core is a core constructed from the same material used to make a green sand mold. It is not dried in an oven but placed in the mold as soon as completed, thereby saving the fuel that is necessary to fire the core oven when dry sand cores are used. In making light castings the green sand core has an advantage over any other core because it overcomes the rough and irregular joints that are often found where a dried core and a portion of the mold come in contact with each other. In cases where a large core is nearly completely surrounded by a thin casting the green core is the best also. If a dried core is used there is always a liability of the heat from the casting causing the material in the dried core to expand and thus break the casting. Another advantage is when cleaning castings a very large dry sand core requires considerable time and labor to dig out of the casting ; if a green sand core is used all that is required is to rap the casting in order to remove the sand.

Green sand cores can be used to advantage in the production of plumbers' ware—*i. e.*, soil pipe, elbows, tees, etc.; also locomotive smoke stacks, railroad oil boxes and similar castings. These cores cannot be made strong enough to be handled without some kind of a support. An arbor, usually made of cast iron, often of wood, is used to carry them.

In making a green sand core for a locomotive smokestack the proper rig would be a cast iron core barrel 1 inch thick, the shape of the cored portion of the stack, allowing only about 1 inch for sand between the barrel and the inside of the stack. The barrel must be cored with prickers about 1½ inches long by ⅛ inch in diameter, tapering to a point, in order to carry the sand. There should be equally as many ¼-inch holes in the barrel to allow the gas to escape freely. Both ends of the barrel should be turned off to suit the ends of the flask the mold is

made in. The core is formed by setting the barrel on 2 wooden horses with iron bearings attached to them for the spindle of the barrel to rest in. The sand is now pressed between the prickers and a strike of the proper shape is placed on the wooden horses the right distance from the barrel. A crank is used to turn the barrel as fast as the sand is pressed between the prickers. In this manner a stack of any thickness may be made from one core barrel.

As soon as the mold is poured and the casting is cool enough a chain is hooked on to the end of the barrel and the barrel and casting are hoisted to a vertical position. A little rapping on the casting will cause the sand between the core barrel and the casting to run out and relieve the sack, which will drop off of the barrel. In this case a dried core would make a very poor job. Not only would it cost more to make the core and furnish the material, but, as stated before, the expansion of the material would break the casting, which generally averages about $\frac{3}{16}$ inch thick.

Core barrels for soil pipe cores are made on the same principle. Instead of prickers, however, depressions are made in the barrel. Where it is not possible to use a core barrel arbor and anchor, lifting plates are used. Often the arbor must be made in sections to enable the molder to get it out of the casting after the mold is poured. Lifting plates are generally made with threads for lifting screws to make it possible to take the screws out after the green sand core is placed in its position in the mold. There is considerable core sand and labor saved in making railroad oil boxes with a green sand core. In this case an arbor made in sections is used, the shape and number of sections depending entirely on the size and shape of the oil box.

There are many small dry sand cores (such as cores forming round and square holes of different sizes) used that could be made in green sand much cheaper. One of the reasons they are not made in green sand is because the pattern maker, as a rule, carries a stock of core prints of different sized round and square cores. He knowing there are core boxes for the different sized cores in the foundry, finds it much less trouble to tack on several small ready made prints than to finish out several holes the same size so they will leave the sand properly. As a result the foundry foreman is disgusted to find that he is compelled to make a lot of small dry sand cores, say 1 inch by $1\frac{1}{2}$ inches, that could just as well be made in green sand. There is, without a doubt, quite a sum of money spent every year for labor and material to make dry sand cores that could just as well be saved or put to some better use. So it is with the dry sand cores; we often find foundrymen worrying along with a job trying to use green sand cores where a dry sand would be the cheaper. To be able to judge which of the two kinds of cores is the better and cheaper to us in making any certain job, we must have practical experience in the business. For instance, in case of the smoke stack a dry sand core would not be practical, neither would a green sand core for the steam ports or bore of a Corliss cylinder be a success.

Green sand cores are not good for making bulky castings where there is a heavy pressure of metal. One reason is because it is not possible to make a green sand core hard enough to withstand as great a pressure as a dry sand core will stand without a cut or scab. Another point in favor of the dry sand core is when it is placed in the mold, say an oil box, if it does not give the proper metal on all sides by reason of it not being placed in properly, it can be taken out and reset, whereas in case of the green sand core it is very risky business to remove it after it has been placed in the mold.

So I say in conclusion that in making light castings there are many cases where the green sand core can be used to a decided advantage. On the other hand there are cases where the dry sand core is the better. I am a little inclined to favor the dry sand core, except in cases as mentioned above, because I think the dried core is the safest, and in making castings of any great size that must be free from dirt, etc., I have always found it cheaper to make a dry sand mold. Many foundries do not favor dry sand cores. Often it is because the core sand they are using is not what it should be. In making cores for locomotive and Corliss engine castinge I use for my core sand mixture about 6 parts heavy molding sand and 4 parts sharp building sand. If my castings do not clean very well or show dirt I add a little more sharp sand. Many foundrymen worry about the blacking. My experience has been, if I used a good open sand and have vented the core of mold well, and had it thoroughly dry, a fair grade of blacking always did the work as well as a more expensive grade.

The foundry supply men often speak of the different foundries that use their blacking. I always think, "Well, no matter how good the blacking if there is not a good open sand behind it."

We often find cases where the blacking on the dry sand mold or core has washed off in flakes before the iron while it was being cast. One of the old established remedies for this trouble is molasses water. This does some good, but I feel satisfied that a little more coarse sand in the mixture would be of more benefit.

ITEMS OF INTEREST FROM VARIOUS LOCALITIES.

MR. ALBERT H. MERRITT has resigned the position of Manager of the gas plant at Waverly, N. Y., to assume charge of the affairs of the Niagara Falls (N. Y.) Gas Company. The interests that control the Waverly plant are also in control at Niagara Falls.

MR. R. SHOCKLETT, formerly of the Columbus (O.) Gas Company, has been appointed Manager of the contract department of the Detroit City Gas Company.

THE annual meeting of the Huntsville (Ala.) Gas Light Company will be held in that city the morning of the 8th prox.

WE are indebted to a correspondent in Los Angeles, Cal., for the following clipping from a recent issue of the Los Angeles *Express:* Users of gas in this city will be gratified to learn that the Los Angeles Lighting Company has announced a reduction of the price of gas to $1.25 per 1,000 cubic feet. This figure is really the lowest price enjoyed by any city in the country, considering the conditions under which manufacture must be conducted here. San Francisco, with double the consumption of gas, still has to pay $1.40 per 1,000. Speaking of San Francisco, it is noted that the various stories about the patents of Professor Lowe having brought about the production of gas in that city at a cost of something like two "bits" per 1,000, are subject to considerable allowance. Prof. Lowe's Company has not yet produced gas in mercantile quantities, nor has it supplied the old San Francisco Companies with their output, as has been reported. President W. B. Cline, of the Los Angeles Lighting Company, informs the *Express* that at the end of this year his Company will have more than 10,000 meters placed in this city. The constantly growing consumption of gas is enormous. Over 20 miles of mains will be laid this year. Yet in the face of all this growth the Company takes no unfair advantage by holding up its customers with a high price, on the contrary reducing the cost to the user voluntarily, and in the entire absence of any public agitation on the subject. It is interesting to note the steady and regular decline in price of gas the past 12 years. Prior to 1889 the price had been $2.50 per 1,000. Figures are appended showing 8 reductions of price since that time: 1890, price, $2.25; 1895, $2; 1896, $1.90; 1898, $1.65; 1900, $1.60; 1901, $1.50; 1901, $1.25. Several morals are to be derived from the setting forth of the relations between the public and the Gas Company. Primarily, it may be said that the general management of the Company, under President Cline, has been eminently businesslike and successful; but the Company makes acknowledgment to the *Express* that its recent great increase of business is largely to be credited to the series of advertisements which the Company has published in the *Express* and other papers, which have drawn attention to the attractive, convenient and economical value of gas in family use, both for cooking as well as lighting purposes.

JANUARY 1st, 1901, the dollar rate named by the Delaware County Gas Company, of Chester, Pa., went into effect. Since that time 250 new meters have been placed, and the gas ranges hooked up in the same period number 352.

MR. ALVAH F. TRAVER, of Jackson, Mich., has been awarded he gas scholarship in the University of Michigan, maintained by the Michigan Gas Association.

MR. FREDERICK K. LANE has resigned from the service of the Akron (O.) Gas Company, which property he ably managed for some time. The resignation took effect the 15th inst.

THE Western Gas Construction Company, of Fort Wayne, Ind., has been awarded the contract for supplying the Edinburgh (Scotland) gas works with two P. & A. tar extractors, each of which is rated to pass 5,000,000 cubic feet per day. On account of some improvements in the construction plan the Company has been enabled to minimize the space required for the machinery, and the vessels are guaranteed to yield 10 per cent. in excess of the contract values. It is said that this construction is the largest unit of the P. & A. ever attempted.

AT the annual meeting of the Binghamton (N.Y.) Gas Company the officers elected were: Directors, J. W. Manier, E. McMillin, J. M. Stevens, Geo. W. Dunn, Geo. F. O'Neil, C. M. Stone, Wm. G. Phelps, Sig. J. Hirschman and C. A. Jackson; President, E. McMillin; Vice-President, J. W. Manier; Secretary, W. F. Douthirt; Treasurer, Robt. W. Manier; Asst. Secy. and Gen. Mgr., F. B. Wheeler.

BLUE ISLAND, Ills., voted early this month to take on the responsibilities of a city. The successful candidate for Mayor (Mr. John L. Zacharies) had for the main "plank" in his platform an announcement that he favored, and would do his utmost to procure, the construction of a gas works in Blue Island.

IT is said, with quite some semblance of authority, that the Connecticut Lighting and Railway Company has made a bid for the possessions of the Bridgeport (Conn.) Gas Light Company.

THE authorities of Martinsville, Ind., have arranged the gas selling rates that may be charged by the Martinsville Gas Light and Fuel Company on the following basis: On illuminating account, $1.35 per 1,000 cubic feet; on fuel account, $1 per 1,000.

MUCH loss has been caused to the Butte (Mont.) Gas Light and Coke Company through the peculiar happenings thus recorded in a clipping recently forwarded us by a correspondent: "The strange sliding movement of Butte, which has been manifested at intervals for several years, is again in evidence, five large crevices having been developed recently in different sections of the city. The largest part ing is in West Galena street where a crevice 12 inches wide, and many yards in length, has appeared. Three of the openings are on the west side of the city and two on the east side. There is no caving, but a distinct parting of the earth and the granite walls can easily be seen in them. City Engineer Rickenbach says that his department occasion ally finds that elevation and bench marks have changed their location. That is particularly true of the section west of Main street and North of Broadway, where the marks have been known to shift to the extent of a foot in a very short time. What is causing the strange phenomenon is not known, but its continuance is beginning to cause some alarm among the citizens of Butte."

MR. FRED. R. DAVIS, who acted as Superintendent of the Athol (Mass.) Gas and Electric Company since 1883, has resigned that position. His successor is Mr. Cyrus M. Pierce, whose main business connection has been with the C. M. Lee Shoe Company, as its bookkeeper. It is understood, though, that Mr. Pierce will act as financinl man of the Company, the works' direction to be in charge of Mr. George McKnight.

THE Legislature of Connecticut has denied the petition of the projectors of the Groton Gas Company.

WRITE to the Charles Millar & Son Company, of Utica, N. Y., for a copy of its current catalogue. It is worth a place close to the operating desk of any gas man.

MESSRS. BARTLETT, Hayward & Co., of Baltimore, Md., seem to be quite busy in the line of holder construction just now, as these details go to show. The main item on their books in such regard is a contract between the Consolidated Gas Company, of this city, and themselves, under which two holders, of a capacity of 5 million cubic feet each, are to be constructed at the Consolidated Company's holder station on the East river, between 110th and 111th streets. These holders, which are to replace 4 holders that rested in masonry tanks, of 300,000 cubic feet capacity each, on the site of the old Harlem Company's works, are to be in steel tanks, and the dimensions provided for them are as follows: Tank, 192 feet 9 inches diameter by 40 feet 1 inch deep; inner section, 180 feet diameter by 38 feet 8 inches deep; second section, 182 feet 6 inches by 38 feet 8 inches deep; third section, 185 feet by 38 feet 8 inches deep; fourth section, 187 feet 6 inches diameter by 38 feet 2 inches deep; fifth section, 190 feet diameter by 37 feet 8 inches deep. The guide framing will consist of 20 trussed standards with 6 rows of latticed girders. Other work that the Company has under construction in this line may be thus specified: For the Consolidated Gas Company, of New York, one 4-lift holder of 4,000,000 cubic feet capacity, to rest in masonry tank, at 65th street. Its dimensions are: Tank, 187 feet in diameter by 43 feet 6 inches deep; first section, 177 feet 9 inches diameter by 42 feet deep; second section, 180 feet diameter by 42 feet deep; third section, 182 feet 3 inches diameter by 41 feet 6 inches deep; fourth section, 184 feet 6 inches diameter by 41 feet deep. The guide frame is composed of 20 latticed standards. For the Flatbush branch of the Brooklyn (N. Y.) Union Gas Company: One 3-lift holder, of 1,000,000 cubic feet capacity, to rest in steel tank, of the dimension of 125 feet 9 inches diameter and 31 feet 4 inches deep. For the Peoples Gas Light and Coke Company, of Chicago: One 5-lift holder, with a capacity of 5,000,000 cubic feet, the dimensions of same to be in accord with those named for the holders for the Consolidated Company, of New York—this holder is to rest in a steel tank. For the Independent Gas and Power Company, of San Francisco. Cal.: One 3-lift holder, of 1,000,000 cubic feet capacity, to rest in steel tank, the dimensions of same to be equal to those noted in connection with the Flatbush vessel; and one 3 lift holder of 500,000 cubic feet capacity, to rest in steel tank, 100 feet in diameter by 25 feet 9 inches deep. The two last named holders are being furnished in connection with some other apparatus for the United Gas Improvement Company, of Philadelphia. For the Lawrence (Mass.) Gas Company: One 3-lift holder, of 750,000 cubic feet capacity, to rest in steel tank, with a dimension of 109 feet 6 inches diameter by 31 feet 4 inches deep. For the Meriden (Conn.) Gas Company: One 3-lift holder, of 700,000 cubic feet capacity, to rest in steel tank; 114 feet diameter by 28 feet 6 inches deep. For the York (Pa.) Gas Company: A single lift, to rest in masonry tank, 80 feet diameter by 21 feet deep. For Salisbury (N.C.) Gas and Electric Company: One single lift, in steel tank, 42 feet diameter by 16 feet 6 inches deep. For the St. Thomas (Danish West Indies) Gas Company: A single lift, 14,000 cubic feet capacity, in steel tank, 38 feet diameter by 13 feet 9 inches deep. For Mexico City, Mexico: Two single lift holders, each of 10,000 cubic feet capacity, steel tanks, 30 feet diameter by 17 feet 9 inches deep—the last named vessels are to be operated in connection with a fuel gas plant for the Loomis Pettibone Company, of New York. For the town of Hempstead Gas and Electric Light Company, Rockaway Beach, N.Y.: One 2-lift holder, 79,000 cubic feet capacity, in masonry tank, 60 feet diameter by 16 feet deep. For the Dover (N. J.) Gas Company: One 2-lift holder, 250,000 cubic feet capacity, to rest in steel tank, 88 feet 6 inches diameter by 24 feet deep; and 1 single lift, of 25,000 cubic feet, in steel tank, 47 feet diameter by 16 feet 6 inches deep. From the above recapitulation it will be seen that the Company has contracts for 17 holders, the aggregate capacity of which is 23,455,000 cubic feet. It is also worthy of note that the largest holders mentioned are, if we mistake not, the first of the 5-lift order that have been arranged for in this country. In addition to the holder business the Company has many orders for subsidiary apparatus, such as condensers, scrubbers, standard washer-scrubbers, station meter cases, etc. Its contracts also include an order for a tar extractor, to be constructed under the lines of the patent (No. 673,171, April 30, 1901) granted to the Company's Engineer, Mr. Fred. J. Mayer.

THE Committee on Manufactures of the Massachusetts Legislsture has declined to order a repeal of the charter of the Haverhill Gas Securities Company.

MR. PIERRE JAY, Secy. and Treas. of the Robins Conveying Belt Company, of New York city and Passaic, N. J., informs us that the patents of the Company (No. 499,472, dated June 13, 1893, and No. 571,604, dated Nov. 17, 1896) have been sustained by the U. S. Circuit Court. The suit which brought out the determination was directed principally against the Exeter Machine Works.

THE Fargo (N. Dak.) Gas and Electric Company will put down 7 miles of mains this season.

ST. PAUL, Minn., maintains 5,479 public lamps on street lighting account. Of these 2,551 are gas lamps; 2,508 are of the gasoline variety, and 420 are electric arc lamps.

A CORRESPONDENT informs us that the Springfield (Mo.) City Council has passed an ordinance directing the local Gas Company to put its selling rate at $1 per 1,000 cubic feet, the reduction to go into effect August 1st. The Company will take the case to the courts.

AN installation on a large scale of the Welsbach street lamp for the lighting of the streets of Washington, D. C., has been authorized by the District Commissioners.

THE proprietors of the Rome (N. Y.) Gas, Electric Light and Power Company have reduced the selling rates. Hereafter an illuminating supply will be charged for at the rate of $1.75. The charge for fuel use to be $1.50.

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PROPRIETORS.

THOS. J. CUNNINGHAM,
ELBERT P. CALLENDER,
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CHAS. E. SANDERSON,
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AGENTS:

New York—American News Co. 39 and 41 Chambers St.
Germany—Lemcke & Buechner, of New York.
England—Aug. Siegle, 30 Lime Street, London.

MONDAY, JUNE 17, 1901.

Coke for Heating Hot-Houses on the Large Scale.

The *Journal of Gas Lighting* says that a very great deal of the agricultural land in the suburbs of large English towns is now covered with glass houses, in which, by the heat of coke fired boilers, an immense quantity of fine garden produce is grown for the market. The owners of these forcing grounds are among the best customers of gas companies. Gas managers are, therefore, likely to be interested in the inquiry of a "Puzzled Nurseryman," recently addressed to the Editor of *Engineering*, as to the way in which the fuel used for greenhouse heating on the large scale can best be economized. The writer complains that the high prices of fuels have made inroads into profits which are at no time large, owing to the great competition in this industry. He wants to know whether it would be better to try getting up steam in one or two boilers, for ultimate heating of masses of circulating water, instead of heating the water direct in boilers of the kind usually employed for greenhouse use. Our contemporary very properly replied that the office of either steam or water in such a connection is merely that of carrying the heat from the furnace to the places required to be warmed. Wherever the demand for heat, we may add, exceeds that of a ¼ acre of glass houses, it is advisable to abandon the use of the ordinary horticultural type of boiler, which is very wasteful of fuel, and adopt the Cornish type of boiler, with coke-fired furnace, which will prove much more economical and satisfactory in every way. Heating on this scale requires regular stoking, night and day.

The Market for Gas Securities.

The market for city gas shares since time of last writing was quite unsettled. Early in the week, under slow demand, prices kept quite stiff, and later on, with a comparatively brisk lot of selling, the rate sagged. To day (Friday) on good dealing (1,700 shares) the stock was bid up to 224, with the closing prices at 223 to 223¼.

Considerable disappointment was experienced in respect of the continued failure of news regarding the probable settlement of the Brooklyn Union absorption, or lease, or etc. The general feeling is that prices for Consolidated gas are about as high now as they will be any time this summer. The business of the Company prospers amazingly.

Brooklyn Union is steady, the closing prices for it to day being 216 to 220. A small lot (12 shares) was sold at auction this week at 217. Peoples, of Chicago, made a gain during the week, and Baltimore Consolidated is well above 64. Mr. Dickey and his friends have made their sound way of working count pretty well so far in extending the business of the Company. The general situation is all in favor of the investor; and that statement especially applies in respect of bonds. The stock of the Gas and Electric Company, of Bergen County, N. J., is virtually at par.

Gas Stocks.

Quotations by George W. Close, Broker and Dealer in Gas Stocks.

16 WALL STREET, NEW YORK CITY.

JUNE 17.

☞ All communications will receive particular attention.

☞ The following quotations are based on the par value of $100 per share.

N. Y. City Companies.	*Capital.*	*Par.*	*Bid.*	*Asked.*
Consolidated	$73,177,000	100	223	223¼
Central Union, Bonds, 5's.	3,000,000	1,000	106½	107
Equitable Bonds, 6's	1,000,000	1,000	105	..
" 1st Con. 5's	2,300,000	1,000	120	..
Metropolitan Bonds	658,000	..	108	112
Mutual	3,500,000	100	300	310
" Bonds	1,500,000	1,000	100	102
Municipal Bonds	750,000	..	..	..
New Amsterdam Gas Co. .. Bonds, 5's	11,000,000	1,000	107¼	108
Northern Union, Bonds, 5's.	1,250,000	1,000	106	108
New York and East River Bonds 1st 5's	3,500,000	1,000	111	115
" 1st Con. 5's	1,500,000	.	106	108
Richmond Co., S. I.	348,650	50	100	..
" Bonds	100,000	1,000	103	..
Standard	5,000,000	100	130	135
Preferred	5,000,000	100	150	155
Bonds, 1st Mortgage, 5's	1,500,000	1,000	115	117
Yonkers	299,650	500	130	..
Out-of-Town Companies.				
Brooklyn Union	15,000,000	100	216	220
" " Bonds (5's)	15 000,000	1,000	118	11
Bay State	50,000,000	50	⅝	¾
" Income Bonds	2,000,000	1,000	.	75
Binghamton Gas Works...	450,000	100	24	28
" 1st Mtg. 5's	509,000	1,000	92⅞	95
Boston United Gas Co.— 1st Series S. F. Trust	7,000,000	1,000	82	85
2d " " "	3,000,000	1,000	47½	50
Buffalo City Gas Co.	5,500,000	100	7	7½
" " Bonds, 5's	5,250,000	1,000	70	71
Capital, Sacramento	500,000	50	..	35
Bonds (6's)	150,000	1,000	..	..
Central San Francisco	2,000,000	..	106	108
Chicago Gas Co. Guaranteed Gold Bonds	7,650,000	1,000	104	104¼
Cincinnati Gas & Elec. Co.	29,500,000	100	103¾	104
Columbus (O.) Gas Co., 1st Mortgage Bonds	1,500,000	1,000	106	107
Columbus (O.) Gas Lt. & Heating Co	1,682,750	100	60	65
Preferred	3,026,500	100	84	86
Consumers, Jersey City Bonds	600,000	1,000	102	103
Consumers, Toronto	1,700,000	50	215	216
Consolidated, Baltimore	11,000,000	100	64	64½
Mortgage, 6's	3,600,000	..	..	118
Chesapeake, 1st 6's.	1,000,000	..	..	..
Equitable, 1st 6's.	910,000	..	..	..
Consolidated, 1st 5's	1,490 000	..	..	112
Consolidated Gas Co. of N.J.	1,000,000	100	11	14
" Con. Mtg. 5's	380,000	1,000	81½	83
Consolidated G. & E. Co.'s., Little Falls, N.Y.	90,000	100	..	100
Bonds	75,000	..	..	100
Detroit City Gas Co.	4,825,500	50	.	89
" Prior Lien 5's	5,603,000	1,000	99½	100
Detroit Gas Co., 5's	381,000	1,000	89	89½
" Inc. 5's	16,000	100	94	94½
Equitable Gas & Fuel Co., Chicago, Bonds	2,000,000	1,000	..	101
Essex and Hudson Gas Co.	6,500,000	..	35	40
Fort Wayne	2,000,000	..	..	.
" Bonds	2,000,000	..	54	58
Grand Rapids Gas Lt. Co. 1st Mtg. 5's	1,225,000	1,000	104	103¼
Hartford	750,000	25	240	250
Hudson County Gas Co., of New Jersey	10,500,000	..	25	..
" Bonds, 5's	10,500,000	..	101	103
Indianapolis	2,000,000	..	60	68
" Bonds, 6's	2 650,000	..	95	98
Jackson Gas Co.	250,000	50	70	75
" 1st Mtg. 5's	290,000	1,000	101	102½
Kansas City Gas Light Co., of Missouri	5,000,000	100	..	36
Bonds, 1st 5's	3,822,000	1,000	101½	103
Laclede, St. Louis	10,000,000	100	84½	85½
Preferred	2,500,000	100	97	101
Bonds	10,000,000	1,000	..	108½
Lafayette Gas Co., Ind.	1,000,000	100		60
Bonds	1,000,000	1,000	60	66
Louisville	2,570,000	50	110	120
Madison Gas & Elec. Co. " 1st Mtg. 6's	350,000	1,000	102½	108
" 6 per cent. scrip, due 1910	100,000	25	87	89
Montreal, Canada	2,000,000	100	182	184½
Newark, N. J., Con. Gas Co	6,000,000	..	..	55
Bonds, 6's	4,600,000	..	..	103
New Haven	1,000,000	25	280	300
Nashville Gas Lt. Co.	1,000,000	50	110	..
Oakland, Cal.	2,000,000	..	46	47
" Bonds	750,000	..	..	..
Peoples G. L. & Coke Co., of Chicago	25,000,000	100	116¾	117
Peoples Gas Lt. & Coke Co., Chicago, 1st Mortgage	20,100,000	1,000	..	..
2d "	2,500,000	1,000	104	
Rochester Gas & Elec. Co.	2,150,000	50	88	..
Preferred	2,150,000	50	118	..
Consolidated 5's	2,000,000	..	87½	90
San Francisco, Cal.	10,000,000	100	..	.
St. Paul Gas Light Co.	1,500,000	100	50	54
1st Mortgage 6's	650,000	1,000	82	85
Extension, 6's	600,000	1,000	..	..
General Mortgage, 5's	2,465,000	1,000	88	90½
St. Joseph Gas Co. " 1st Mtg. 5's	751,000	1,000	36	39
Syracuse, N. Y.	1,750,000	100	15	19
Bonds	1,612 000	1,000	91	93
Washington, D. C	2,600,000	20	290	291
First mortgage 6's	600,000	..	..	..
Western, Milwaukee. Bonds, 5's	4,000,000	..	93½	95
Wilmington, Del	600,000	50	200	201

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DIVIDEND NOTICE.

OFFICE OF THE UNITED GAS IMPROVEMENT CO.,
N. W. CORNER BROAD AND ARCH STS.,
PHILADELPHIA, PA., June 12, 1901.

The Directors have this day declared a quarterly dividend of 2 per cent. (one dollar per share), payable July 15th, 1901, to stockholders of record at the close of business, June 23. Checks will be mailed.

1358-4 LEWIS LILLIE, Treasurer.

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Situation as Superintendent

In some Southern city. Have had 20 years' experience as manager of gas and electric light plants. Best references.

Address, "K Z,"
1358-1 Care this Journal.

POSITION WANTED

As Working Superintendent, Assistant Superintendent or Foreman.

Twelve years' experience in laying mains and services, reading, setting and repairing meters. Understands the setting and adjustment of all kinds of gas appliances; is competent in the manufacture of coal gas. Is 27 years of age, is married, is willing and industrious, and is desirous of getting a steady position. Medium or small company preferred. Best of references, from two gas companies.

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Position Wanted

As Superintendent of Small Coal Gas Works,

By a man who has over 20 years' experience as such. Can take charge of station and do all kinds of street work. Has had very good success in getting new consumers, both for light and fuel. Address, J. R. TODD,

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Position Wanted

As Superintendent of Gas Works,

By a man who, for the last 17 years, at different times, has worked on a salary, leased and owned interests in gas works. Can give the best of references. Address,

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GEORGE McLEAN,

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Ironwork for three benches of six retorts complete.

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One Gasholder, 65 feet diameter, 20 feet deep.

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One No. 2 Roots' Exhauster, with engine.

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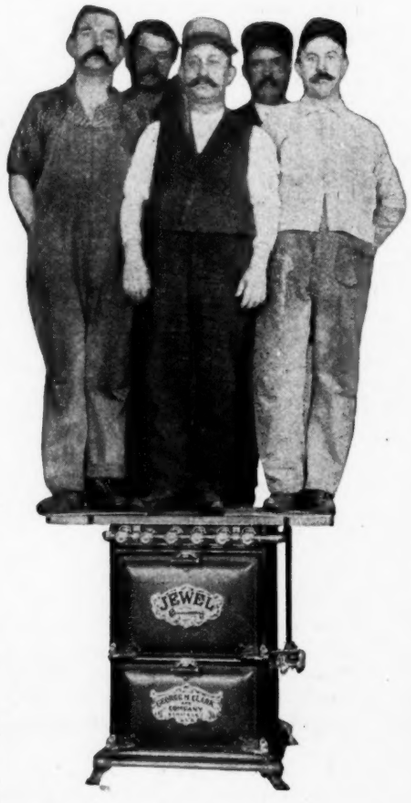

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FRED. K. WELLS,
Manager.

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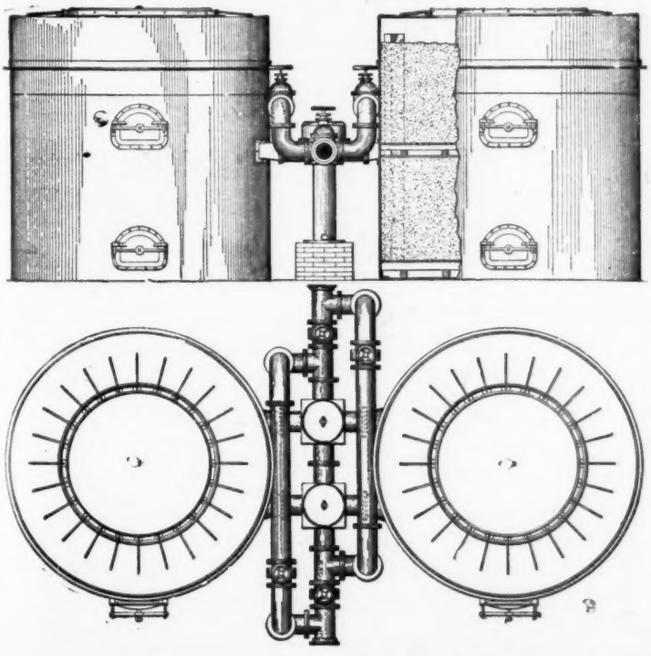

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Ottawa (Second Contract)	250,000
Brantford (Remodeled)	200,000
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Buffalo, N. Y.	2,000,000
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Colchester, England (Second Contract)	300,000
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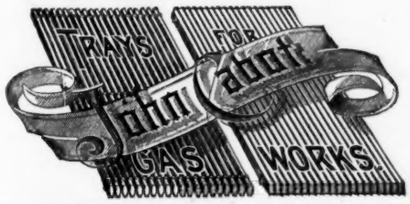

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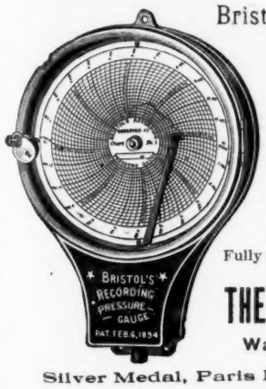

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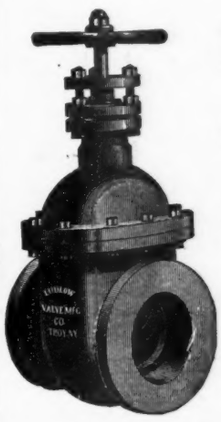

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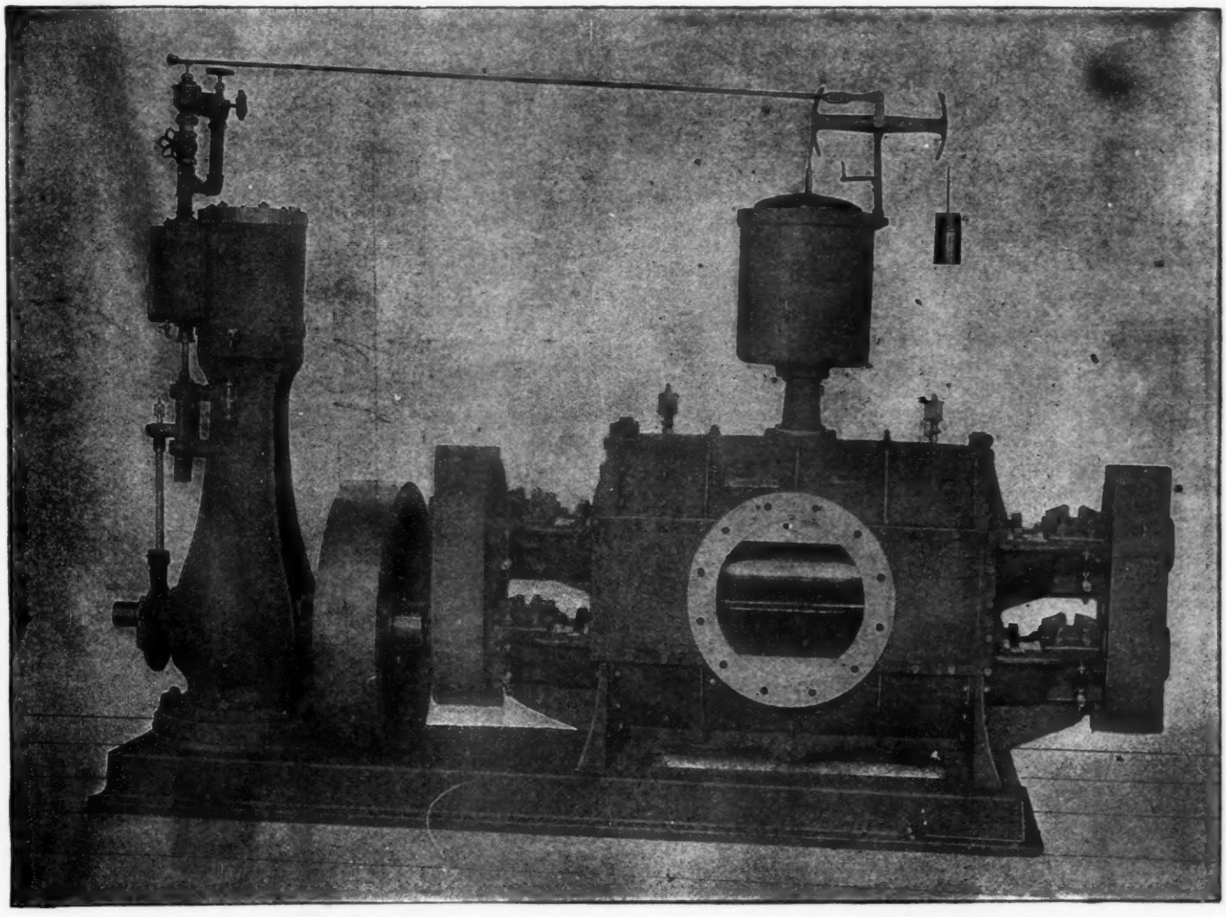

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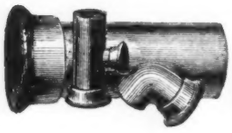

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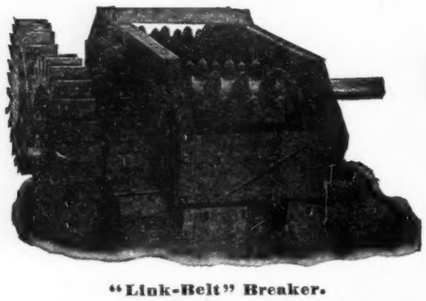

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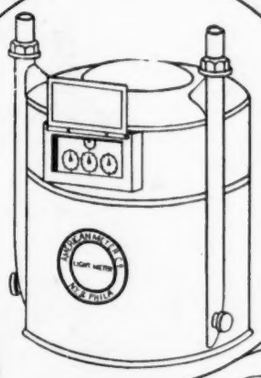
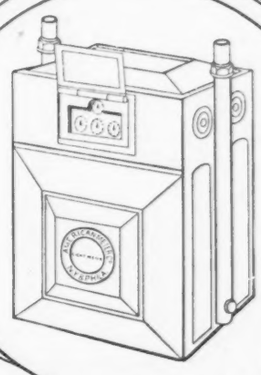
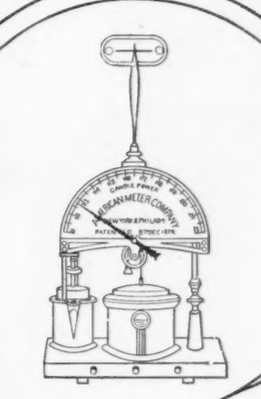


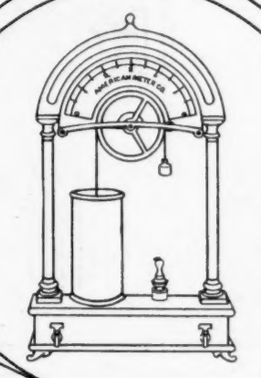


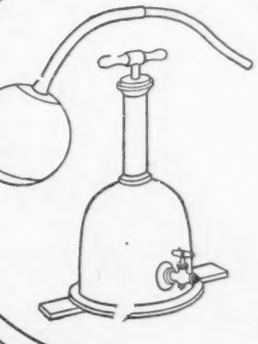
PUBLIC LIGHTING TABLE.

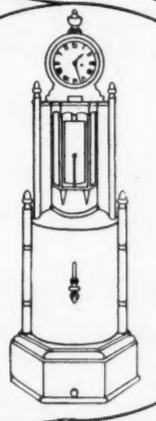
JULY, 1901.

Day of Week.	Date.	Table No. 1. Following the Moon. Light.	Table No. 1. Following the Moon. Extinguish.	Table No. 2. New York City. All Night Lighting. Light.	Table No. 2. New York City. All Night Lighting. Extinguish.
				P.M.	A.M.
Mon.	1	No L. FM	No L.	7.30	3.15
Tue.	2	No L.	No L.	7.30	3.15
Wed.	3	8.00 PM	9.30 PM	7.30	3.15
Thu.	4	8.00	10.10	7.30	3.15
Fri.	5	8.00	10.40	7.30	3.15
Sat.	6	8.00	11.10	7.30	3.15
Sun.	7	8.00	11.50	7.30	3.15
Mon.	8	8.00 LQ	12.20 AM	7.30	3.15
Tue.	9	8.00	1.00	7.30	3.15
Wed.	10	8.00	1.40	7.30	3.15
Thu.	11	8.00	2.30	7.30	3.15
Fri.	12	8.00	3.40	7.30	3.15
Sat.	13	8.00	3.40	7.30	3.15
Sun.	14	8.00	3.40	7.30	3.15
Mon.	15	8.00 NM	3.40	7.30	3.15
Tue.	16	8.00	3.40	7.20	3.15
Wed.	17	8.00	3.40	7.20	3.15
Thu.	18	8.00	3.40	7.20	3.15
Fri.	19	8.00	3.40	7.20	3.15
Sat.	20	8.50	3.40	7.20	3.15
Sun.	21	9.20	3.50	7.20	3.15
Mon.	22	9.50	3.50	7.20	3.15
Tue.	23	10.20 FQ	3.50	7.20	3.15
Wed.	24	10.50	3.50	7.20	3.15
Thu.	25	11.40	3.50	7.20	3.15
Fri.	26	12.20 AM	3.50	7.20	3.15
Sat.	27	1.10	3.50	7.20	3.15
Sun.	28	2.10	3.50	7.20	3.15
Mon.	29	No L.	No L.	7.20	3.15
Tue.	30	No L. FM	No L.	7.10	3.30
Wed.	31	No L.	No L.	7.10	3.30



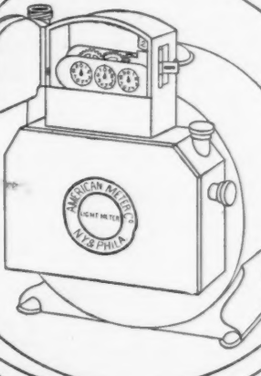


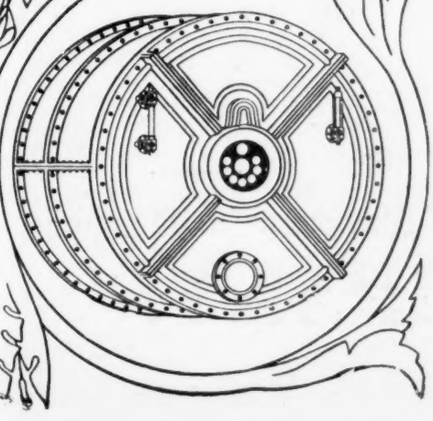




TOTAL HOURS LIGHTING DURING 1901.

By Table No. 1.	Hrs.Min.	By Table No. 2.	Hrs.Min.
January	220.10	January	423.20
February	192.30	February	355.25
March	180.00	March	355.35
April	158.30	April	298.50
May	140.40	May	264.50
June	135.40	June	234.25
July	138.00	July	243.45
August	156.20	August	280.25
September	174.40	September	321.15
October	202.30	October	374.30
November	220.40	November	401.40
December	241.30	December	433.45
Total, yr.	2161.10	Total, yr.	3987.45





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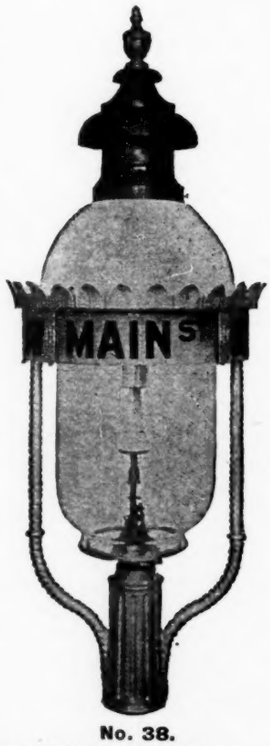

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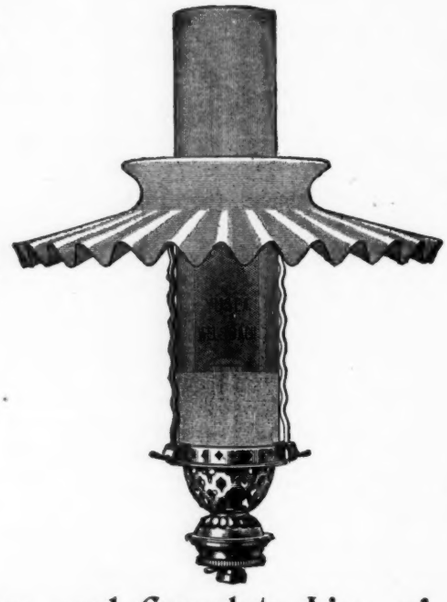

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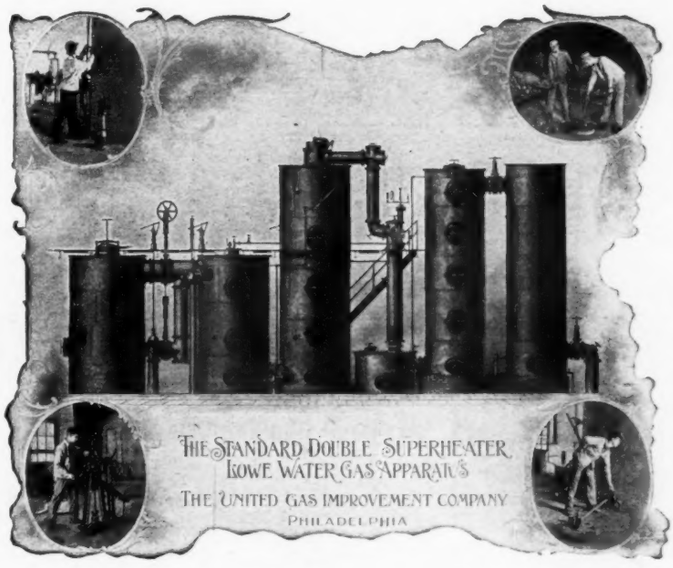
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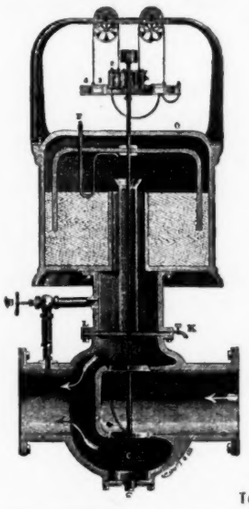

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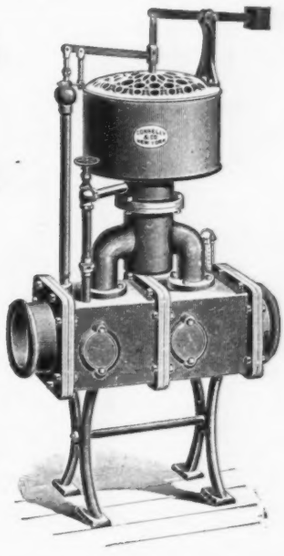

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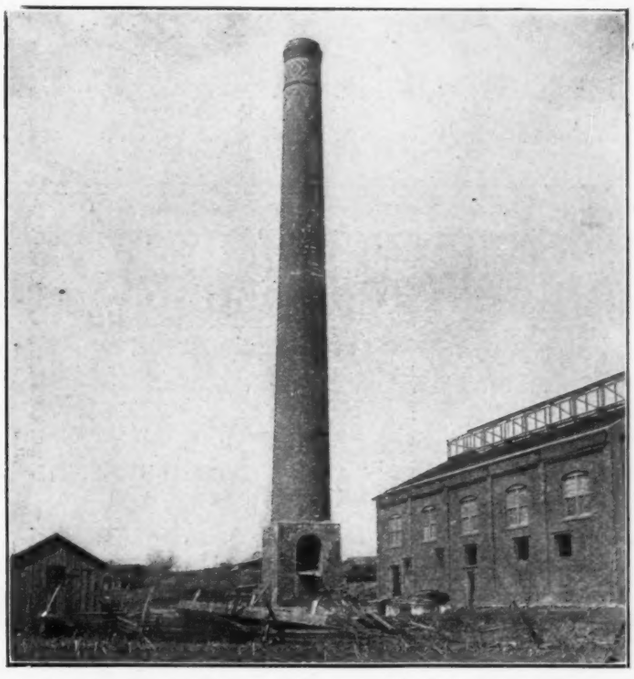

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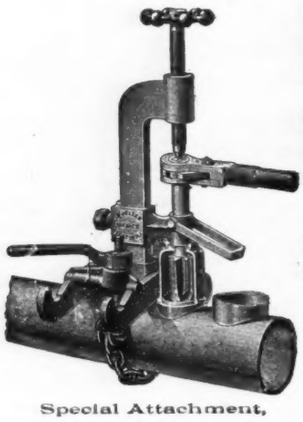

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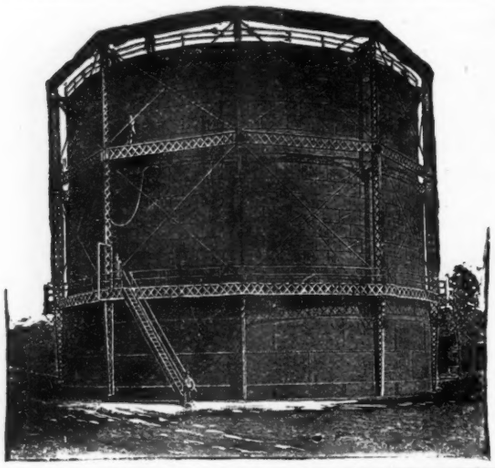

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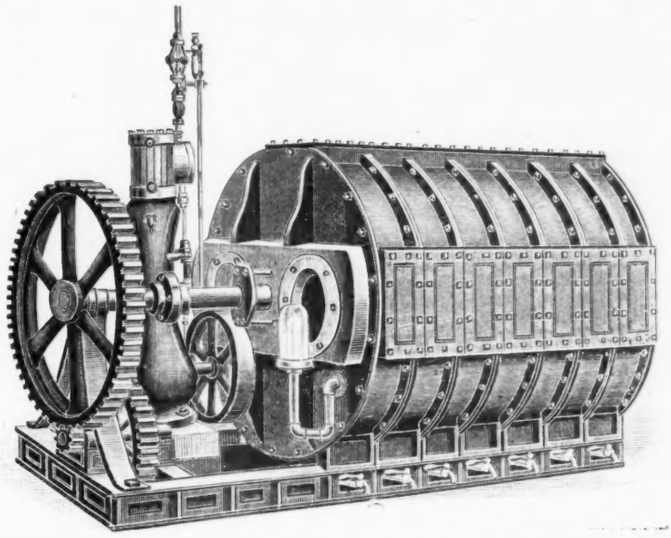

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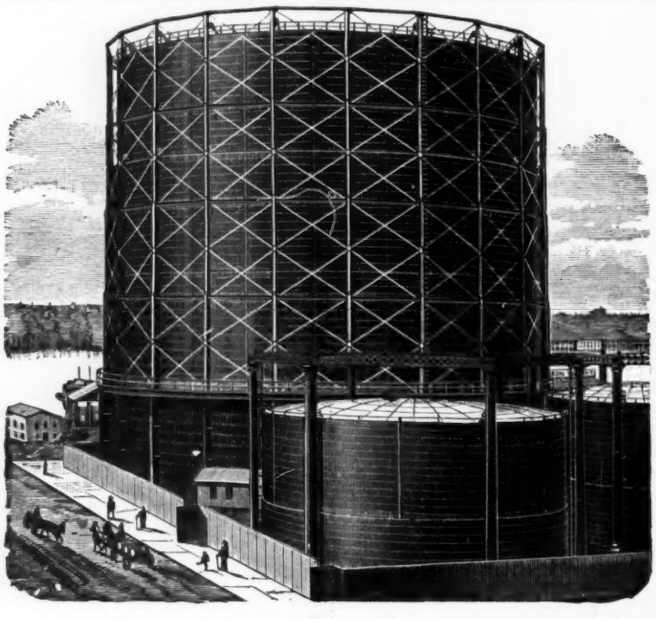

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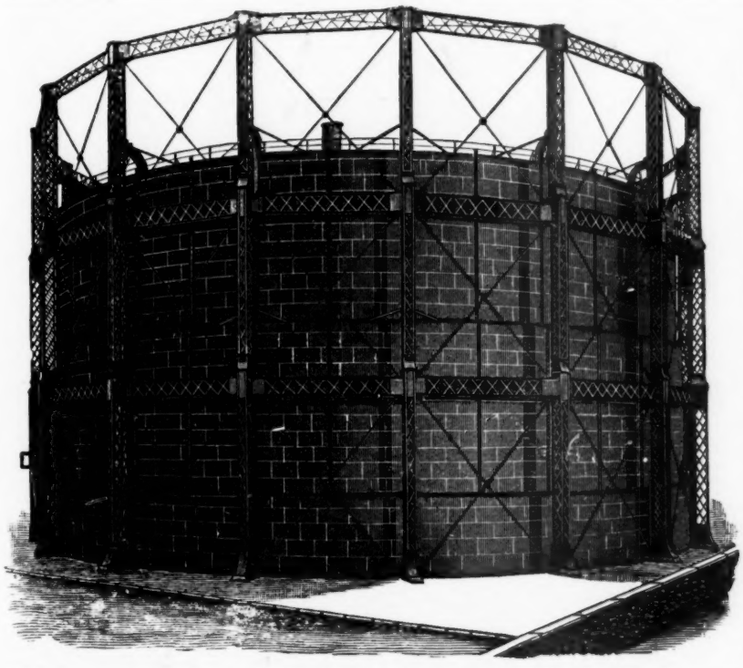

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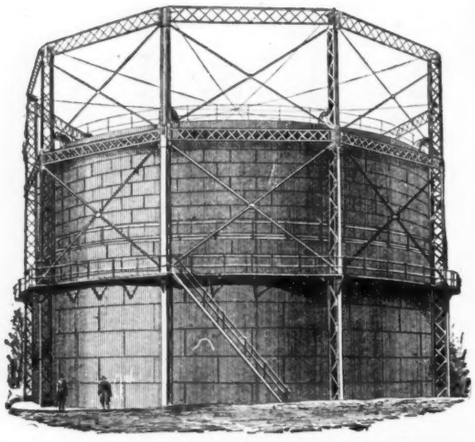

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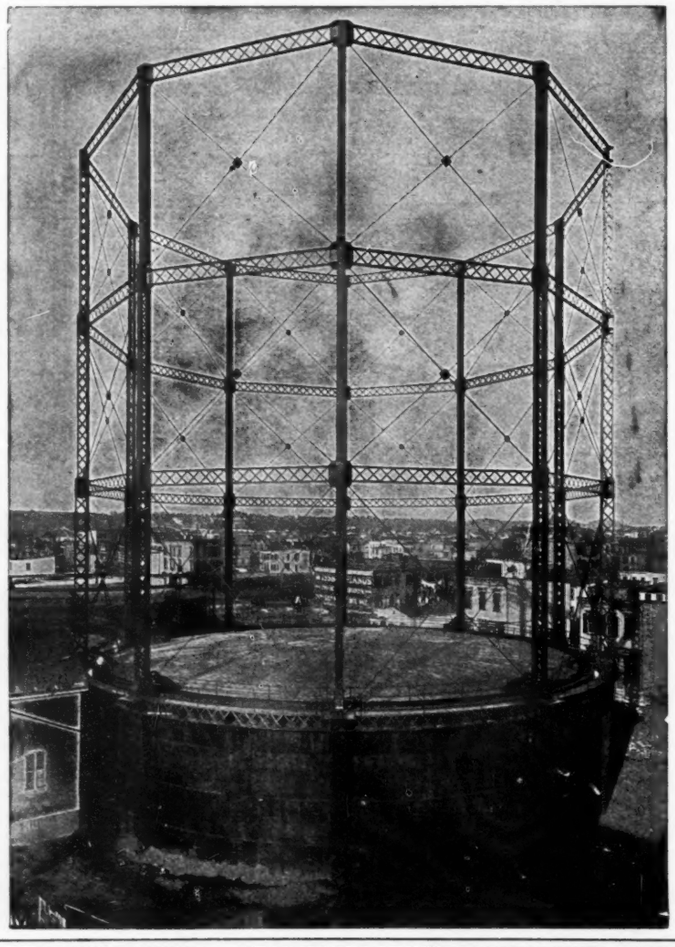

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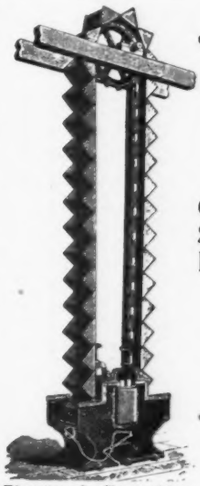

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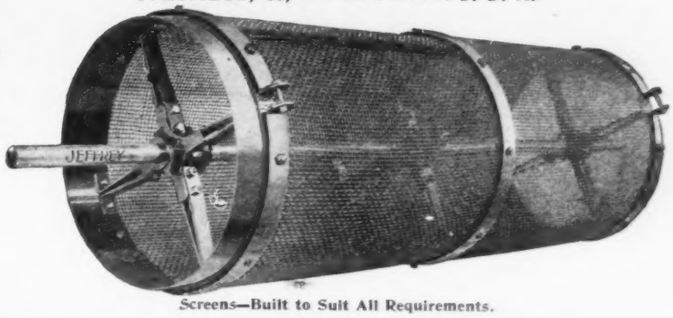

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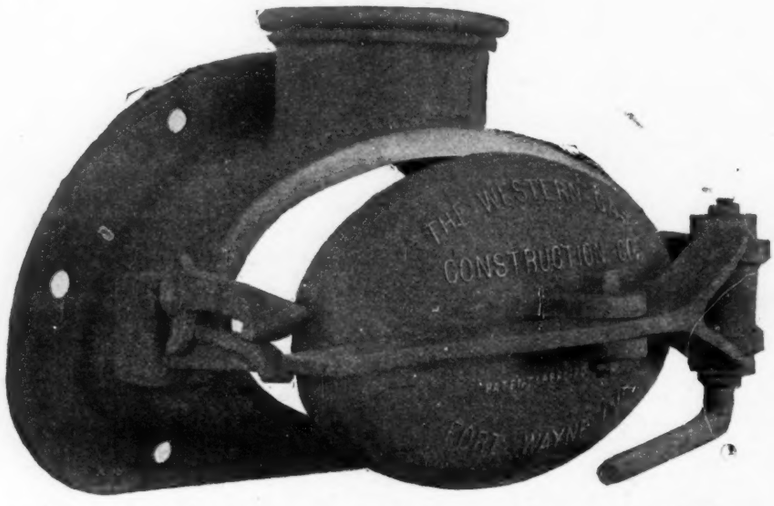

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